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# THE PELAGIC COPEPODS OF THE IZU REGION, MIDDLE JAPAN SYSTEMATIC ACCOUNT, V -FAMILY EUCHAETIDAE-

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# THE PELAGIC COPEPODS OF THE IZU REGION, MIDDLE JAPAN SYSTEMATIC ACCOUNT, V

## FAMILY EUCHAETIDAE

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*With 19 Text-figures*

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## Family EUCHAETIDAE

### Genus *Euchaeta* PHILLIP, 1843

The genus *Euchaeta* was separated by A. SCOTT in two: *Euchaeta* and *Pareuchaeta*. The chief differences between the two genera are in the armature of the spines on the apex of the 2nd maxilla of the female and in the structure of the male 5th pair of legs. In PHILLIP's type the 5th pair of legs are decidedly different from those found in *Euchaeta norvegica* BOECK; in *Euchaeta* in restricted sense two of the six apical spines of the 2nd maxilla, in addition to being furnished with rows of very fine short spinules, have also a number of moderately long and conspicuous spinules in the female; the male is characterised by the possession of long spiniform terminal joint on both sides of the 5th pair of legs.

SEWELL (1947) divided *Euchaeta* (sensu stricto) into two groups: Group I, of which *Euchaeta marina* (PRESTAND.) may be taken as the type; in the female of the group two of the apical spines arising from the terminal portion are armed with long spinules; to this group may be referred *E. marina* and *E. wolfendeni* A. SCOTT. In Group II only a single spine arising from the endopod of the 2nd maxilla is furnished with lateral spinules; in this group the following species are included: *E. acuta* GIESBRECHT, *E. concinna* GIESBRECHT, *E. consimilis* FARRAN, *E. media* GIESBRECHT, *E. spinosa* GIESBRECHT, *E. tenuis* ESTERLY and *E. mrrrayi* SEWELL.

Following 6 species have been reported from the Japanese waters by MORI: *E. marina* (PRESTAND.), *E. wolfendeni* A. SCOTT, *E. longicornis* GIESBRECHT, *E. concinna* DANA, *E. plana* MORI, and *E. media* GIESBRECHT. Two more species *E. pubera* SARS and *E. spinosa* GIESBRECHT were added to the list of the Japanese species.

*Euchaeta marina* PRESTANDREA

*Euchaeta marina* GIESBRECHT, 1892, p. 245; A. SCOTT, 1909, p. 67; WOLFENDEN, 1911, p. 299; SEWELL, 1912, p. 360; G. O. SARS, 1925, p. 104; FARRAN, 1929, p. 237; SEWELL, 1929, p. 148; WILSON, 1932, p. 63; MORI, 1937, p. 43; SEWELL, 1947, p. 113; WILSON, 1950, p. 214; BRODSKY, 1950, p. 197.

*Length.* Female, 3.10–3.26 mm; male, 3.50–3.64 mm.

*Remarks.* The present female specimen belongs to the small-sized example which has been suggested by SEWELL (1947).

*Occurrence.* Very common in the surface layer.

*Distribution.* The species has a wide distribution in the Pacific, Indian and Atlantic Oceans.

*Euchaeta wolfendeni* A. SCOTT

*Euchaeta wolfendeni* A. SCOTT, 1909, p. 68, pl. 17; SEWELL, 1914, p. 216; SEWELL, 1929, p. 153; FARRAN, 1936, p. 91; MORI, 1937, p. 44; SEWELL, 1947, p. 115; WILSON, 1950, p. 217.

*Length.* Female, 2.45–2.70 mm; male, 2.45 mm.

*Occurrence.* Fairly common in the surface layer.

*Distribution.* The species has been recorded from the Malay Archipelago, Maldive Archipelago and the Indian Ocean. It is also distributed in the warm waters of Japan.

*Euchaeta longicornis* GIESBRECHT

*Euchaeta longicornis* GIESBRECHT, 1892, p. 246; A. SCOTT, 1909, p. 66; FARRAN, 1929, p. 238; FARRAN, 1936, p. 89; MORI, 1937, p. 45; WILSON, 1950, p. 212.

*Length.* Female, 2.56–3.00 mm; male, 3.00 mm.

*Occurrence.* It is common in the surface layer.

*Distribution.* It is widely distributed in the temperate and warm waters of the Pacific and Indian Oceans. It has been recorded from the warm waters in Japan.

*Euchaeta concinna* DANA

*Euchaeta concinna* GIESBRECHT, 1892, p. 246; A. SCOTT, 1909, p. 65; WOLFENDEN, 1911, p. 299; SEWELL, 1929, p. 146; FARRAN, 1936, p. 90; MORI, 1937, p. 45, pl. 20; WILSON, 1950, p. 212.

*Length.* Female, 2.87–3.25 mm; male, 2.59–2.80 mm.

*Occurrence.* It is common in the surface layer.

*Distribution.* It has been recorded from the Indian and Pacific Oceans.

*Euchaeta plana* MORI

(Fig. 62, a-g)

*Euchaeta plana* MORI, 1937, p. 46, pl. 21, figs. 1-8.

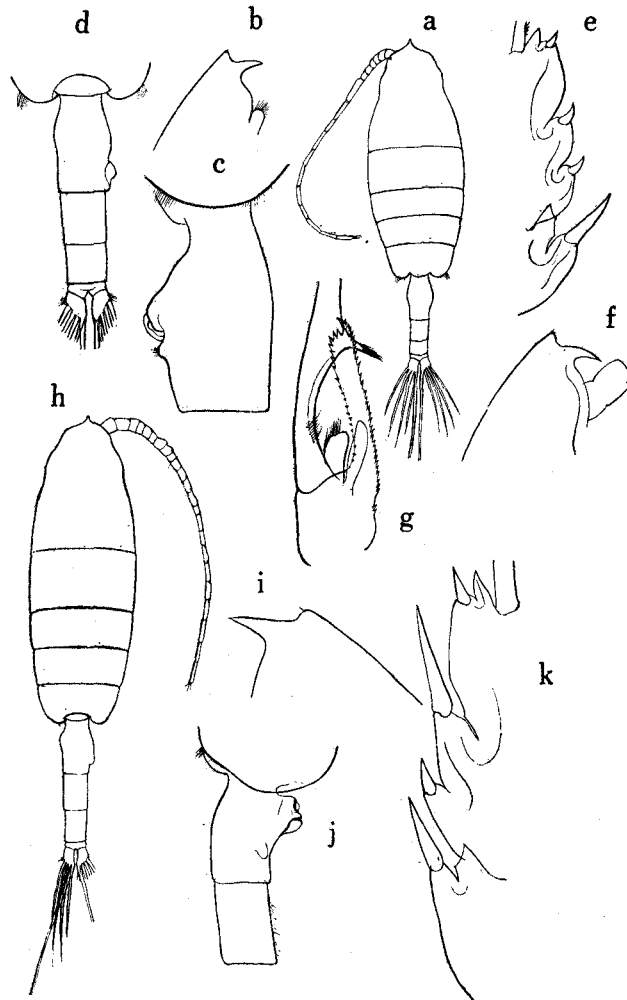


Fig. 62. *Euchaeta plana* MORI (a-g).

Female: a, dorsal aspect; b, head, lateral aspect; c, last thoracic segment and genital segment, lateral aspect; d, last thoracic segment and abdomen, dorsal aspect; e, exopodite of 2nd leg. Male: f, head, lateral aspect; g, 2nd joint of exopodite of left 5th leg.

*Euchaeta media* GIESBRECHT (h-k).

Female: h, dorsal aspect; i, head, lateral aspect; j, last thoracic segment and abdominal segments, lateral aspect; k, exopodite of 2nd leg.

*Female.* Length, 2.87–3.38 mm. The abdomen is contained about 2.3 times in the length of the cephalothorax. The lateral corner of the last thoracic segment evenly rounded. The frontal prominence high. The rostrum curved downwards.

The proportional lengths of the four free abdominal segments and furca are 44:23:17:3:13=100. The genital segment slightly asymmetrical: the right side is more inflated. Some specimens have on the distal right corner of the genital segment a conical chitinous attachment which can be easily removed. The 2nd and 3rd segments are furnished densely with fine short hairs. The furcal setae are of about equal lengths. The appendicular seta long and strong.

The 1st antenna extends about to the middle of the genital segment. The 1st outer lobe of the 1st maxilla has 5 setae.

In the 1st leg the outer margin of the joints 1–2 of the exopodite is straight. The 2nd leg has on the 2nd joint of the exopodite a moderately long outer edge spine extending to the base of the proximal spine of the 3rd joint of the exopodite; the 2nd outer marginal spine of the 3rd joint is short.

*Male.* Length, 2.75–2.95 mm. The male has the similar structure in the 5th pair of legs as those of *E. concinna*; the process on the 2nd joint of the exopodite of the left leg is more coarsely denticulated.

*Occurrence.* It is common in the surface layer.

*Distribution.* The species is distributed in the temperate waters of Japan.

### *Euchaeta media* GIESBRECHT

(Fig. 62, *h–k*)

*Euchaeta media* GIESBRECHT, 1892, p. 246; ESTERLY, 1905, p. 160; A. SCOTT, 1909, p. 66; FARRAN, 1929, p. 238; SEWELL, 1929, p. 149; FARRAN, 1936, p. 89; MORI, 1937, p. 46; pl. 18; SEWELL, 1947, p. 116; WILSON, 1950, p. 214; BRODSKY, 1950, p. 200, fig. 116; VERVOORT, 1957, p. 84.

*Female.* Length, 40.0–4.32 mm; *male*, length, 3.63 mm.

*Remarks.* The male specimen is synonymous with the male of *E. acuta* var. *pacifica* described by ESTERLY.

*Occurrence.* The species is rather rare in the Izu region.

*Distribution.* The species has a wide distribution in the temperate and warm waters of the Pacific, Indian and Atlantic Oceans.

### *Euchaeta pubera* G. O. SARS

(Fig. 63, *a–e*)

*Euchaeta pubera* SARS, 1925, p. 109, pl. 30; FARRAN, 1929, p. 238; WILSON, 1950, p. 215.

*Female.* Length, 3.75 mm: cephalothorax, 2.80 mm; abdomen, 0.95 mm. The body is covered with short hairs. The lateral corner of the last thoracic segment evenly

rounded. The rostrum rather slender, directs straight forwards.

The abdomen is contained 3 times in the length of the cephalothorax. The proportional lengths of the four free segments and furca are  $43:17:17:4:19=100$ . The genital segment has a lateral swelling on each side about the proximal 1/3 of the segment; the ventral surface has claw-like process on the genital protuberance. The 2nd and 3rd segments are very setose. The appendicular seta very long, at least, 7 times as long as the other marginal setae which are of about the same lengths.

The 1st antenna extends to the end of the last thoracic segment.

The outer edge spine of the 2nd joint of the exopodite of the 2nd leg reaches the middle of the proximal spine of the 3rd joint.

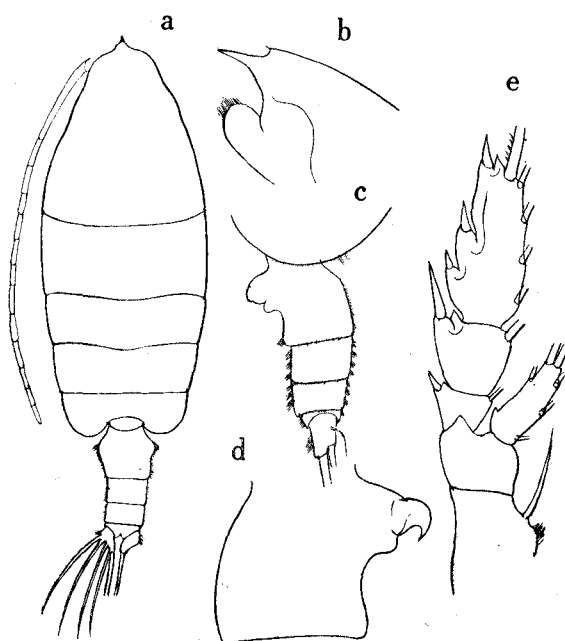


Fig. 63. *Euchaeta pubera* G. O. SARS.

Female: a, dorsal aspect; b, head, lateral aspect; c, last thoracic segment and abdomen, lateral aspect; d, genital segment, lateral aspect; e, 2nd leg.

*Remarks.* SARS in his "Copepoda bathypelagique" says that *E. pubera* is identical with *E. wolfendeni* A. SCOTT. But the latter is a quite different species, and has been collected from the surface layer of the tropical and subtropical regions of the Pacific, Indian and Malay Archipelago, whereas, the former is deep sea species.

*Occurrence.* Only a single female was collected in the vertical haul 1000-0 m, July 1936 in Suruga Bay.

*Distribution.* It has been recorded from the deep waters of the Atlantic.

*Euchaeta spinosa* GIESBRECHT

(Fig. 64, a-e)

*Euchaeta spinosa* GIESBRECHT, 1892, p. 246; ESTERLY, 1905, p. 159; SARS, 1925, p. 104; FARRAN, 1929, p. 256; SEWELL, 1929, p. 149; SEWELL, 1949, p. 117; WILSON, 1950, p. 217; BRODSKY, 1950, p. 200.

*Female*. Length, 7.20 mm: cephalothorax, 5.20 mm; abdomen, 2.00 mm. The cephalothorax elongate ovate. The lateral corner of the last thoracic segment rounded, and is furnished with tufts of hairs and scattered short hairs. The rostrum slender, directs straight and slightly downwards. The frontal prominence high.

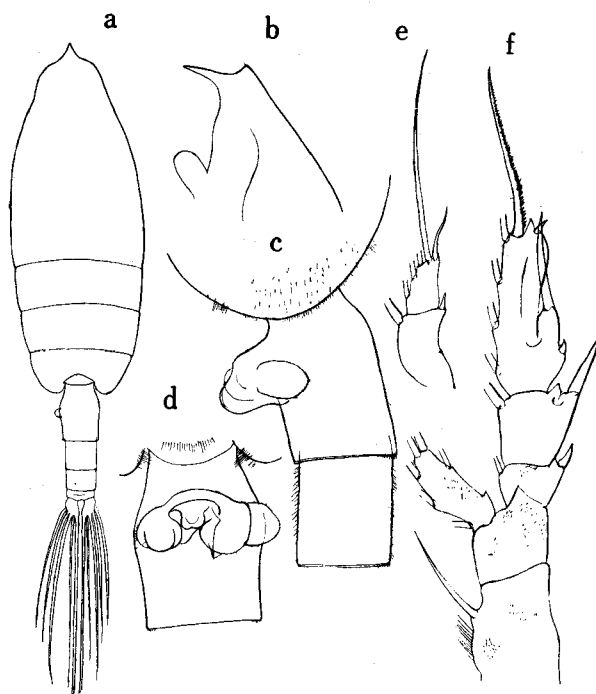


Fig. 64. *Euchaeta spinosa* GIESBRECHT.

Female: a, dorsal aspect; b, head, lateral aspect; c, last thoracic segment and abdominal segments, lateral aspect; d, genital segment, ventral aspect; e, exopodite of 1st leg; f, 2nd leg.

The abdomen is contained 3.6 times in the length of the cephalothorax; the segments and furca in the proportional lengths 42:23:16:8:11=100. The genital segment slightly asymmetrical: the lateral margin produced on the middle of the left side; the genital protuberance also asymmetrical; there is a rounded prominence arising from the genital boss on the left side; the lateral flanges asymmetrical, that

of the left side is conspicuous. The furcal rami about as long as wide. The appendicular seta very long, about 5 times as long as the abdomen.

The 1st antenna extends to the middle of the distal margin of the 3rd abdominal segment; the joints 3, 7, 9 and 14 have each a long seta. The mouth parts as described by GIESBRECHT.

The 1st leg has 2-jointed exopodite; the line of fusion detectable. The 2nd leg has 3-jointed exopodite and 1-jointed endopodite; the outer edge spine of the 2nd joint of the exopodite exceeds the distal margin of the 1st outer marginal spine of the 3rd joint; the 2nd outer marginal spine of the 3rd joint of the exopodite exceeds the distal margin of the joint; the basal joints, the 1st joint of the exopodite and endopodite are furnished with groups of minute spines on the posterior surface; the endopodite of the same leg is covered with spinules also on the anterior surface. The 3rd leg has 3-jointed exopodite and endopodite; the basal joints, the exopodite and endopodite are furnished with fine spinules both on the posterior and anterior surfaces. The 4th leg has 3-jointed exopodite and endopodite, and has the same structure as in the 3rd leg.

*Occurrence.* Only a single female from Suruga Bay from the depth 1000-0 m, March 1938.

*Distribution.* The species has been recorded from the Mediterranean Sea and Indian Ocean, also from the San Diego region, Azores and Canary.

### Genus *Pareuchaeta* A. SCOTT, 1909

The genus was created by A. SCOTT to accommodate a number of species that differ from the PHILLIPS's type in the armature of the apical setae of the 2nd maxilla, and by the structure of the male 5th pair of legs. According to G. O. SARS the appendicular seta of the female is long and thickened in *Euchaeta*, whereas, it is slender in *Pareuchaeta*. FARRAN called attention to the fact that in *Euchaeta hebes* T. SCOTT and *E. russelli* FARRAN the innermost seta of the 6th lobe of the 2nd maxilla has long and widely separated spinules, and, further, the appendicular seta of the furca is thickened and prolonged in the female; the 3rd joint of the male left 5th leg is not prolonged into a point; these two species appear to be intermediate form between *Euchaeta* and *Pareuchaeta*. SARS, however, included *E. hebes* in the genus *Euchaeta*.

SEWELL (1947) divided *Pareuchaeta* into 4 groups according to the number of setae arising from the outer lobe of the 1st maxilla: Group I. Le 1 of the 1st maxilla of the female bears in all 9 setae, of which 6 are stout, and the 2 proximal and the distal setae are considerably smaller; to this group belong *P. hansenii* (WITHER), and *P. weberi* A. SCOTT. Group II. Le 1 of the 1st maxilla of the female bears 7 setae, of which the 2 proximal are usually small; to this group belong *P. barbata* (BRADY), *P. californica* (ESTERLY), *P. scotti* (FARRAN). Group III. Le 1 of the 1st maxilla of the female bears 6 setae; to this group belong *P. bisinuata* SARS. Group IV. Le 1



of the 1st maxilla of the female bears 5 setae; to this group belong *P. scotti* (WOLFENDEN) and *P. russelli* (FARRAN).

VERVOORT (1957) is of opinion that separation of the genera *Euchaeta* and *Pareuchaeta* is unjustified. He, accordingly, divided the genus *Euchaeta* into 5 groups according to the characters of the apical setae of the 2nd maxilla in the female and the vestigial 3rd left exopodal joint of the 5th pair of legs in the male: 1. *E. marina* group; 2. *E. flava* group; *E. hebes* group; 4. *E. pubera* group; 5. *E. norvegica* group. To the last group belong the species of the genus *Pareuchaeta*.

Most of the species belonging to *Pareuchaeta* have a minute outer edge spine at the bottom of the concavity where the 1st and 2nd joints of the exopodite of the 1st leg are fused, whereas, this spine is absent in *Euchaeta*. In *Pareuchaeta* the outer edge spine of the 2nd exopodal joint of the female 2nd leg shows different proportional lengths in accordance with the species involved. We can divide the length into three groups: 1. the spine exceeds beyond the end of the proximal outer marginal spine of the 3rd joint; to this group belong *P. californica* (ESTERLY) and *P. sibogae* A. SCOTT; 2. the spine reaches about to the end of the proximal outer marginal spine of the 3rd joint; to this group belong *P. barbata* (BRADY), *P. malayensis* SEWELL, *P. bisinuata* SARS, *P. weberi* A. SCOTT, *P. confusa* sp. nov., *P. calva* sp. nov., *P. aequatorialis* nom. nov.; 3. the spine exceeds beyond the base but not reaches the end of the proximal outer marginal spine; to this group belong *P. sarsi* (FARRAN), *P. hanseni* (WITH), *P. comosa* sp. nov., *P. propinqua* (ESTERLY) and *P. tonsa* (GIESBRECHT).

Three species of this genus have been reported by MORI from the Japanese waters: *E. flava* GIESBRECHT, *E. japonica* MARUKAWA and *E. daitomarui* MORI: the first species appears to be not identical with *E. flava* GIESBRECHT; the second species is synonymous with *E. elongata* ESTERLY; the third species is clearly the synonym of *E. russelli* FARRAN. SEWELL (1929) recorded the following eight species from the Indian Seas: *P. barbata* (BRADY), *P. bisinnata* SARS, *P. californica* (ESTERLY), *P. investigatoris* SEWELL, *P. gracilicauda* A. SCOTT, *P. malayensis* SEWELL, *P. tuberculata* A. SCOTT, and *P. weberi* A. SCOTT. I have detected in the collection 16 species, of which three appear to be new to science. WOLFENDEN (1911) described a form under the name *E. scotti* but his specimen differs from FARRAN's original type of *scotti* in certain particulars. I have, therefore, given to the WOLFENDEN's form a new name *P. aequatorialis*.

### *Pareuchaeta russelli* (FARRAN)

(Fig. 65, a-g)

*Euchaeta russelli* FARRAN, 1936, p. 91, fig. 7, a-i; *Euchaeta daitomarui* MORI, 1937, p. 48, pl. 23, figs. 4-8.

*Female*. Length, 3.14-4.06 mm. The abdomen is contained 2.6-times in the length of the cephalothorax. The lateral corner of the last thoracic segment rounded, with

three tufts of hairs; the one on the dorsal, and the other two on the ventral margins. The rostrum directs forwards and slightly downwards. The frontal prominence low.

The proportional lengths of the first three abdominal segments are 23:13:12. The genital protuberance slightly projecting; the genital aperture is enclosed by a pair of curved lateral flanges; that on the left side is more prominent than that on the right; the genital segment has tufts of hairs on the distal margin of the ventral surface; there is a faint transverse dorso-lateral ridge to the left of the middle line at the anterior one-third of the genital segment. The first three segments are covered with fine short hairs. The furca very setose; the 2nd furcal seta about 2 times, and the appendicular seta about 3 times as long as the remaining marginal ones.

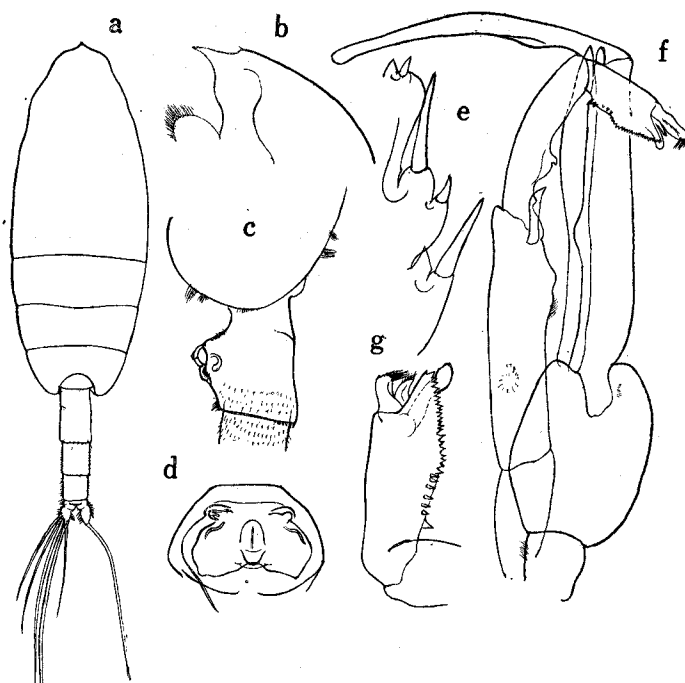


Fig. 65. *Pareuchaeta russelli* (FARRAN).

Female: a, dorsal aspect; b, head, lateral aspect; c, last thoracic segment and genital segment, lateral aspect; d, genital opening, ventral aspect; e, exopodite of 2nd leg. Male: f, 5th pair of legs; g, terminal joints of left 5th leg.

The 1st antenna reaches the posterior corner of the last thoracic segment; the lengths of the distal joints in 0.01 mm are as follows:

Joint	15	16	17	18	19	20	21	22	23	24-25
	13.4	16	16	17.9	20.5	21.5	19.2	16	16	21.5 ;

the 17th joint is shorter than the 21st, the 19th is about as long as the 24-25th. The

1st maxilla has 5 long setae on the 1st outer lobe. In the 2nd maxilla one of the apical setae is furnished, in addition being furnished with rows of short spinules, with long widely separated spinules; this is a generic character of the genus *Euchaeta* (sensu stricto).

The exopodite of the 1st leg has a small outer edge spine at the bottom of the concavity where the 1st and 2nd joints are fused. In the exopodite of the 2nd leg the outer edge spine of the 2nd joint exceeds the middle of the proximal spine of the 3rd joint; the 2nd outer marginal spine of the 3rd joint reaches the distal margin of the joint.

*Male.* Length, 3.10–3.45 mm. The abdomen is contained 2.42 times in the length of the cephalothorax. The lateral corner of the last thoracic segment rounded. The rostrum more slender than that of the female, and directs downwards.

The genital segment has a small dorsal process near the anterior border when viewed in lateral aspect. The 2nd, 3rd and 4th segments are fringed with coarse teeth on the posterior margin. The 2nd furcal seta about 2-times, the appendicular seta as long as the remaining marginal ones.

The 1st antenna extends beyond the end of the last thoracic segment by distal one joint; no aesthetasc on the 20th joint; the articular membrane between the joints 12 and 13 distinct across to the posterior margin.

The mouth parts and the 1st to 4th legs have no interesting features.

In the left 5th leg the middle process of the distal joint of the exopodite is shorter than the tooth-plate of the 2nd joint; the 3rd joint of the exopodite short; the 1st joint of the exopodite of the left leg has a triangular process on the inner margin about the proximal 1/3 of the joint.

*Remarks.* The present species occupies, as stated by FARRAN, a similar position to *Euchaeta hebes* GIESBRECHT, in having the characters of *Euchaeta* in the female, and that of *Pareuchaeta* in the male. *Euchaeta daitomarui* described by MORI from the Japanese waters is identical with the present species.

*Occurrence.* The species is very common in the surface and intermediate layers of the Izu region.

*Distribution.* The species has been recorded from the Great Barrier Reef region. It is widely distributed in the warm waters of the North and South Pacific.

### *Pareuchaeta simplex* sp. nov.

(Fig. 66, a–h)

*Euchaeta fiava* MORI, 1937, p. 47, pl. 21, 22.

*Female.* Length, 3.15–3.45 mm. General appearance as in *P. russelli*. The abdomen is contained 2.5 times in the length of the cephalothorax. The posterior margin of the last thoracic segment rounded, and has two tufts of hairs, one on the dorsal and the another on the posterior corner; the postero-dorsal margin, between these

tufts of hairs, is furnished with short hairs when viewed from the lateral. The rostrum curved somewhat downwards. The frontal prominence low.

The first three abdominal segments have the following proportional lengths measured in 0.01 mm: 41:22:20. The genital protuberance not deep; the lateral flanges of the genital pore symmetrical; the inner chitinous process rounded in lateral aspect; the genital segment contracts laterally at the proximal one-fourth of the segment when viewed from the dorsal; the 2nd and 3rd segments are covered with fine hairs. The furcal rami as in *P. russelli*.

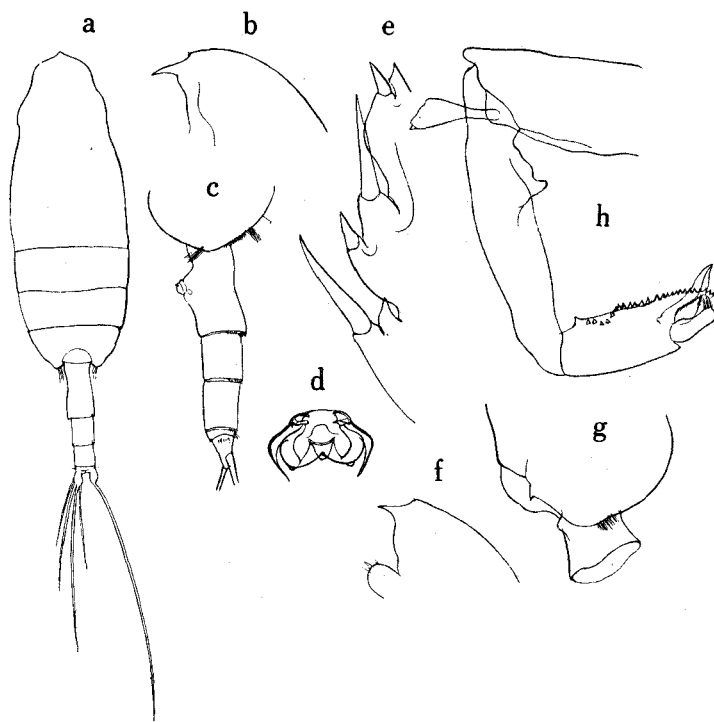


Fig. 66. *Pareuchaeta simplex* sp. nov.

Female: *a*, dorsal aspect; *b*, head, lateral aspect; *c*, last thoracic segment and abdomen, lateral aspect; *d*, genital opening, ventral aspect; *e*, exopodite of 2nd leg. Male: *f*, head, lateral aspect; *g*, last thoracic segment and genital segment, lateral aspect; *h*, 1st and 2nd joints of exopodite of left 5th leg.

The 1st antenna exceeds the posterior margin of the last thoracic segment by distal 2 joints; the lengths of the joints being in the following lengths in 0.01 mm:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	9.2	7.3	5.5	6.4	5.5	7.8	7.3	10.1	7.3	7.3	9.2	11.9	11.0	13.8
	16	17	18	19	20	21	22	23	24-25					
	14.7	15.6	16.3	19.2	19.2	18.4	16.5	15.6	20.0					

the joints 24-25 are 1.14 times as long as the 19th, whereas, it is only 1.04 times in *P. russelli*.

*Male*. Length, 2.77-2.88 mm. The specimen resembles quite well with the male of the preceding species. Abdomen is contained 2.4-2.5 times in the length of the cephalothorax. Rostrum slender, directs downwards. The proportional lengths of the first 4 abdominal segments in 0.01 mm are 17.9, 17.9, and 12.5.

The 1st antenna as that of the preceding species; the joints are in the following lengths measured in 0.01 mm:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	11.0	7.3	4.6	6.9	6.4	6.9	7.3	16.5		6.4	9.2	9.2	9.2
	15	16	17	18	19	20	21	22	23	24-25			
	10.1	11.9	11.9	12.8	15.6	15.6	15.0	14.7	13.7	19.3.			

The mouth parts and swimming legs are as in *P. russelli*. The 5th pair of legs as those of *P. russelli*, but the 3rd finger of the terminal joint of the left leg is tapered.

*Remarks*. The specimen is closely related to *E. russelli*, and also to *E. flava* GIESBRECHT. MORI described and figured a species under the name *E. flava* from the Japanese waters. GIESBRECHT's *flava* has the genital protuberance produced ventrally when viewed from the lateral aspect, whereas MORI's, *flava* and the present specimen have the genital protuberance not so produced ventrally. MORI's *flava* appears to be identical with the present species. GIESBRECHT's description and figures of *E. flava* are not given enough in details for the identification of so closely allied species.

*Occurrence*. The specimens were collected in small numbers mixed with *P. russelli* from the surface and intermediate layers. GIESBRECHT's *flava* was collected from the South Pacific. FARRAN (1929, 1936), WOLFENDEN (1911) and WILSON (1950) failed to detect *E. flava* GIESBRECHT from the South Pacific.

### *Pareuchaeta barbata* (BRADY)

(Fig. 67, a-e)

*Euchaeta barbata*, FARRAN, 1908, p. 40; WITH, 1915, p. 174; *Pareuchaeta barbata*, SARS, 1925, p. 112; JESPERSEN, 1934, p. 78, WILSON, 1950, p. 276; BRODSKY, 1950, p. 209; VERVOORT, 1957, p. 83.

The incomplete description and figures of *Euchaeta barbata* first given by BRADY have caused confusion in the determination of the species, and many authors have attempted to identify *Euchaeta barbata* BRADY. Up to the present several distinct species have been reported as *Euchaeta barbata*. It is generally accepted that the form described by FARRAN (1908) under the name *E. barbata* is the same species that had been described by BRADY. SEWELL (1929) described a form that differed from FARRAN's specimen. SEWELL says that his specimen taken from the Indian

waters is the nearest to the BRADY's type though smaller in size than those found in the other waters. SEWELL's specimen differs from that described by FARRAN in the following: small in size, the shape of the lateral corners of the last thoracic segment, the absence of the tubercle on the left lateral margin of the genital segment, the proportional lengths of the 1st antenna, the number of the setae on the outer lobe of the 1st maxilla, and the length of the proximal spine on the 3rd joint of the exopodite of the 2nd leg. I have detected two specimens which are quite identical with the form described by FARRAN though much smaller in size.

*Female.* Length, 6.17 mm: cephalothorax, 4.76 mm; abdomen, 1.94 mm. The abdomen is contained about 2.5-times in the length of the cephalothorax. The lateral margin of the last thoracic segment rounded and slightly contracted at the postero-



Fig. 67. *Pareuchaeta barbata* (BRADY).

Female: *a*, head, lateral aspect; *b*, last thoracic segment and abdominal segments, lateral aspect; *c*, genital segment, ventral aspect; *d*, exopodite of 1st leg; *e*, exopodite of 2nd leg.

ventral corner, and carries a tuft of hairs. The frontal prominence low. The rostrum directs downwards.

The abdomen 4-segmented; the abdominal segments and furca in the proportional lengths  $42:21:23:4:10=100$ ; the genital segment has a lateral tubercle on the left margin when viewed from the ventral; according to SEWELL there is no additional swelling in BRADY's specimen but FARRAN says it was impossible to see whether

the lateral tubercle of the genital segment were present or not in the BRADY's original specimen. The 2nd and 3rd segments have each long hairs on the ventral surface. The furca setose; the outermost seta very minute; the appendicular seta more slender than the remaining marginal setae and about 2 times as long as the combined lengths of the abdominal segments and furca; the 2nd inner seta slightly shorter than the appendicular seta.

The 1st antenna extends to the middle of the 2nd abdominal segment when pressed to the body; the proportional lengths of the joints measured along the posterior margin are as follows:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	54	43	24	22	24	24	24	30	21	19	24	38	41	49
	16	17	18	19	20	21	22	23	24-25					
	57	57	60	70	68	60	57	54	79	=1000;				

the proportional length of the terminal joint of the FARRAN's form measured by SEWELL is 63, and slightly shorter than the joint 19(68), whereas, according to WITH the joint 24-25 are slightly longer than the joint 19, my measurement also indicated that the joints 24-25 are longer than the joint 19; the joint 21 is 1.05 times as long as the 16th, this agrees well with SEWELL's measurement on FARRAN's form.

The outer lobe of the 1st maxilla has 5 long and 2 short setae on the right side but it has only 5 long and one short setae on the left side in the specimen dissected. The 2nd maxilla and maxillipede do not show any distinct characters.

In the 1st leg the outer marginal spine at the bottom of the concavity of the joints 1-2 of the exopodite reaches about the middle of the 2nd joint. The 2nd leg has a long outer edge spine on the 2nd joint of the exopodite; the proximal spine of the 3rd joint short, not reaching the middle of the 2nd section between the proximal and 2nd marginal spine; the 2nd marginal spine of the 3rd joint of the exopodite does not reach the distal margin of the joint; the sinus at the base of the 2nd spine reaches the line joining the base of the 1st outer marginal spine and the 2nd inner marginal seta. The mouth parts and swimming legs are of deep crimson colour.

*Remarks.* BRODSKY's specimen taken from the Far Eastern Seas are much larger in size than the present specimen. His specimens measured 8.0-8.4 mm in female, and have the rostrum directing straight forwards; the lateral margin of the last thoracic segment not contracted at the postero-ventral corner. The small lateral tubercle on the margin of the genital segment is illustrated in his figure showing lateral aspect but he missed it in the figure showing ventral aspect. In other respects his specimen agrees quite well with the present specimen.

*Occurrence.* Two females from Sagami in the vertical hauls 1000-0 m in November 1937.

*Distribution.* The species has been recorded from the deep waters of the Atlantic, Far-Eastern and Polar seas, and the Pacific Ocean.

*Pareuchaeta malayensis* SEWELL

(Fig. 68, a-h)

*Pareuchaeta barbata*, A. SCOTT, 1909, p. 70; *Pareuchaeta malayensis*, SEWELL, 1929, p. 160; SEWELL, 1947, p. 121; VERVOORT, 1957, p. 84.

*Female*. Length, 6.0-7.2 mm. The abdomen is contained 2.3-2.5 times in the length of the cephalothorax. The lateral corner of the last thoracic segment rounded but with sudden constriction of the outline near the ventro-posterior margin as figured by A. SCOTT. The rostrum directs downwards; the base of the rostrum rather broad. The proportional lengths of the abdominal segments and the furca are 45:20:18:5:12=100.

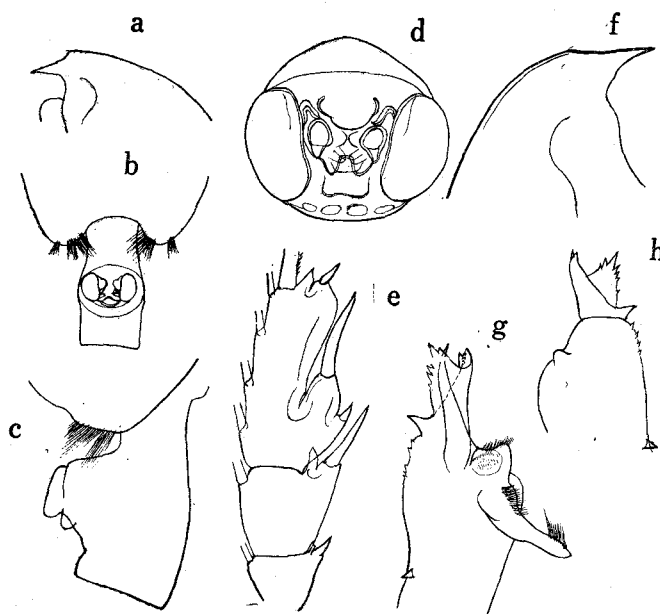


Fig. 68. *Pareuchaeta malayensis* SEWELL.

Female: a, head, lateral aspect; b, last thoracic segment and genital segment, ventral aspect; c, last thoracic segment and genital segment, lateral aspect; d, genital opening, ventral aspect; e, exopodite of 2nd leg. Male: f, head, lateral aspect; g, 2nd joint of exopodite of left 5th leg; h, anterior aspect of the same joint.

The 1st antenna extends at least to the middle of the 2nd abdominal segment; the Indian specimens has the antenna reaching only the distal corner of the last thoracic segment. A. SCOTT's specimen has a long 1st antenna reaching the middle of the 2nd abdominal segment. The present specimen has the 1st antenna with the following proportional lengths:



Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	44	39	23	21	26	23	26	31	18	21	23	41	39	49
	16	17	18	19	20	21	22	23	24-25					
	60	60	62	73	76	72	57	54	78	=1000;				

these lengths correspond closely with SEWELL's measurements; the distal joint is 1.4 times as long as the penultimate one; the joints 2 to 13 are fringed with fine hairs on the posterior margin.

The 2nd antenna with the exopodite 1.1 times as long as the endopodite (43:39). The mandible with the exopodite 1.3 times as long as the endopodite (12:9). The outer lobe of the 1st maxilla has 7 long and 2 short setae. The maxillae, maxillipede, 1st and 2nd legs are of crimson colour.

*Male.* Length, 6.19 mm. The cephalothorax, 4.37 mm; the abdomen, 1.82 mm; the abdomen is contained 2.42 times in the length of the cephalothorax. The abdominal segments and furca are in the proportional lengths 19:27:21:15:6:12=100. The frontal prominence low. The rostrum directs downwards but not vertically. The 1st abdominal segment has a dorsal process on the anterior border. The furcal setae about as long as the combined lengths of the abdominal segments and furca; the appendicular seta about half the length of the remaining marginal setae; the 2nd seta about 3 times as long as the marginal ones.

The 1st antenna extends beyond the end of the thoracic segment by last two joints; the 20th joint has no aesthetask.

In the 5th pair of legs the 1st joint of the exopodite of the right leg has a process on the outer margin; the left leg has a tooth plate which is deeply incised at the apex on the 2nd joint of the exopodite; the denticles are less in number than those of the SEWELL's specimen; the inner process of the 3rd joint of the exopodite produced into a sharp point; the middle process short.

*Remarks.* SEWELL named the specimen taken from the Indian Seas *P. malayensis* which he believed to be identical with the specimen of *P. barbata* A. SCOTT. In my collection there occurred the examples which resemble closely the "Siboga" specimen of *P. barbata* A. SCOTT. A comparison of my present specimen with *P. malayensis* of the Indian Seas brought some differences in the size, length of the 1st antenna, and the shape of the lateral corner of the last thoracic segment. The present specimens are closer to the "Siboga" specimen of *P. barbata* A. SCOTT than to *P. malayensis* SEWELL taken from the Indian Seas.

*Occurrence.* Ten females and five males were collected from Sagami and Suruga Bays from the depth 1000 m to the surface in 1937.

*Distribution.* The species has been recorded from the Malayan region and Indian Seas.

*Pareuchaeta bisinuata* G. O. SARS

(Fig. 69, a-e)

*Euchaeta bisinuata*, FARRAN, 1908, p. 45; *Pareuchaeta bisinuata*, A. SCOTT, 1909, p. 70; WITH, 1915, p. 183 G. O. SARS, 1925, p. 123; SEWELL, 1929, p. 158; JESPERSEN, 1934, p. 82; SEWELL, 1947, p. 125; WILSON, 1950, p. 276.

*Female*. Length, 5.5 mm: cephalothorax, 3.94 mm; abdomen, 1.56 mm. The abdomen is contained 2.56 times in the length of the cephalothorax. The last thoracic segment with bluntly rounded lateral margin which bears a postero-ventral tuft of

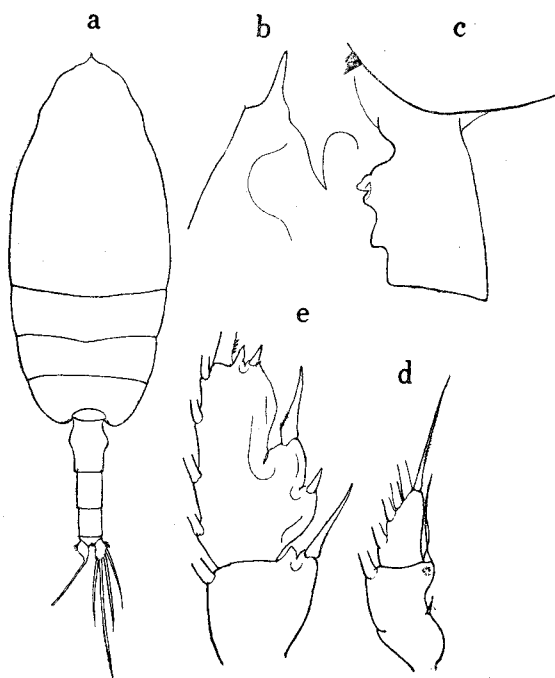


Fig. 69. *Pareuchaeta bisinuata* G. O. SARS.

Female: a, dorsal aspect; b, head, lateral aspect; c, last thoracic segment and genital segment, lateral aspect; d, exopodite of 1st leg; e, exopodite of 2nd leg.

hairs. The rostrum slender, directs straight forwards. The frontal prominence moderate.

The abdomen 4-segmented, the segments and furca in the proportional lengths 36:25:21:2:16=100. The genital protuberance slightly projects ventrally, and the ventral margin of the segment has two lobes when seen in lateral view. The 2nd and 3rd segments without hairs on the ventral surface. The 2nd inner furcal seta about 1.5 times, and the appendicular seta 3 times as long as the remaining marginal ones.

The 1st antenna 23-jointed, extends about to the end of the last thoracic segment; the distal 10 joints are in the proportional lengths:

Joint	15	16	17	18	19	20	21	22	23	24-25
	10	11	12	14	16	16	14	12	12.5	17.

The outer lobe of the 1st maxilla has 6 long setae. The other mouth parts as in *E. barbata* (BRADY).

In the endopodite of the 1st leg the articular membrane between the 1st and 2nd joints is distinct; the outer margin forms well-marked concavity; the outer marginal spine at the bottom of the concavity is fairly long. In the 2nd leg the outer edge spine of the 2nd joint of the exopodite reaches about the end of the proximal outer marginal spine of the 3rd joint; the 2nd outer marginal spine of the 3rd joint reaches the base of the 3rd spine of the same joint.

*Occurrence.* 2 females from Sagami in the hauls 1000-0 m, November 1937.

*Distribution.* The species appears to have a wide distribution, and has been recorded from the North Atlantic and Indian Oceans.

### *Pareuchaeta confusa* sp. nov.

(Fig. 70, *a-i*)

Several species relating closely to *Euchaeta barbata* BRADY have been taken in the collection. Among them was an example which comes near to *Pareuchaeta malayensis* SEWELL. But on closer examination the species is distinct from either *P. malayensis* or *P. barbata* described by SEWELL. The species appears to be undescribed, for which I propose the name *P. confusa*.

*Female.* Length, 6.6-7.6 mm. The abdomen is contained 2.3-2.5 times in the length of the cephalothorax. The head boldly rounded in lateral view. The lateral corner of the last thoracic segment produced into broadly triangular process with an usual tuft of hairs. The rostrum slender, directs forwards; the frontal prominence low.

The abdomen 4-segmented, the segments and furca in the proportional lengths 41:24:21:3:11=100. The genital segment 1.8 times as long as wide, with lateral swellings when viewed from the dorsal; the genital boss has in lateral view a rounded lateral flange and a posterior process being separated from the former by incision which is the posterior limitation of the genital opening; in ventral view it is covered by the rounded lateral flanges; within these plates chitinous plates of complicated structure are observed; the distal margin of the genital segment has short hairs on the ventral surface. The 2nd segment has poor hairs on the dorsal, but it is very setose on the ventral. The 3rd and 4th segments are also setose on the ventral. The 2nd furcal seta about 2 times as long as the marginal ones; the appendicular seta long and slender.

The 1st antenna 23-jointed, extends to the lateral corner of the last thoracic segment; the joints are in the following proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	45	37	25	23	25	25	25	34	23	23	31	39	42	48
	16	17	18	19	20	21	22	23	24-25					
	62	59	62	70	67	64	56	48	67	=1000;				

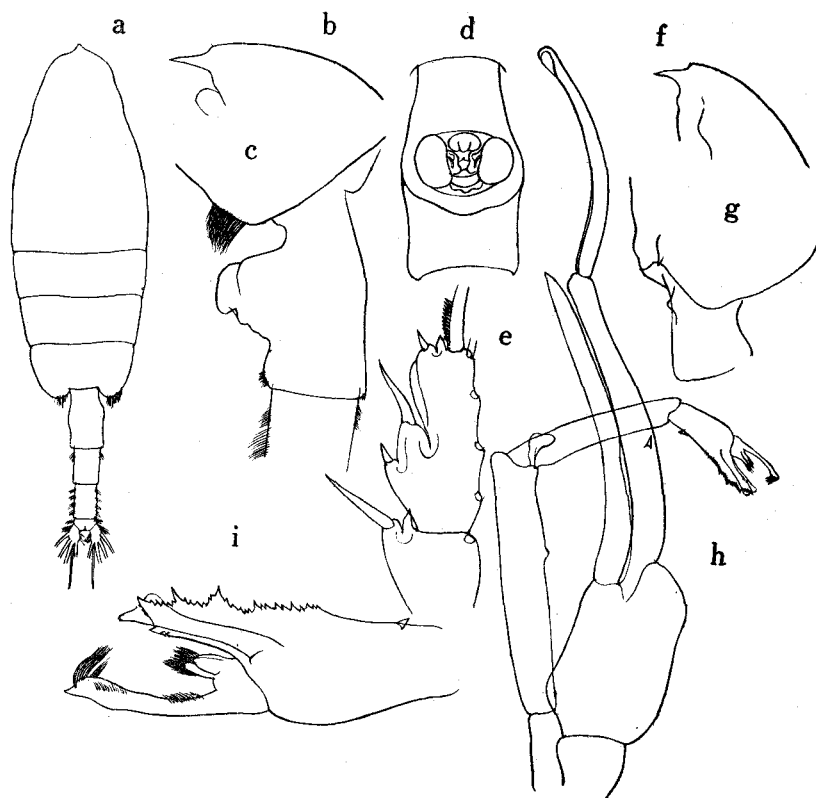


Fig. 70. *Pareuchaeta confusa* sp. nov.

Female: *a*, dorsal aspect; *b*, head, lateral aspect; *c*, last thoracic segment and abdominal segments, lateral aspect; *d*, genital segment, ventral aspect; *e*, exopodite of 2nd leg, lateral aspect; *f*, head, lateral aspect; *g*, last thoracic segment and genital segment, lateral aspect; *h*, 5th pair of legs; *i*, terminal joints of left 5th leg.

the distal joint is 1.36 times as long as the penultimate one; the 21st is 1.08 times as long as the 17th; in the specimen which SEWELL believed to be an example of *Euchaeta barbata* BRADY the distal joint is 1.32 times as long as the penultimate one, and in *P. malayensis* it is 1.48 times; the present specimen is near to *P. barbata* described by SEWELL in the proportional lengths of the joints of the 1st antenna. My specimen of *P. malayensis* is furnished with fine hairs on the posterior margin

of the joints 2 to 15 of the 1st antenna but in the present specimen these hairs are observed on the joints 2 to 13.

The 2nd antenna, mandible, maxillae and maxillipede as in *P. malayensis*. The outer lobe of the 1st maxilla has 7 long and 2 short setae.

The 1st leg as in the foregoing species. In the 2nd leg the marginal spine of the 2nd joint of the exopodite reaches half-way to the proximal spine of the 3rd joint; the proximal spine of the 3rd joint reaches half-way to the base of the 2nd spine; the 2nd spine of the 3rd joint reaches the distal margin of the joint; the sinus at the base of the 2nd spine is deep but the bottom of the sinus falls short of the line drawn between the base of the proximal spine and the 2nd inner marginal seta.

*Male.* Length, 6.00–7.00 mm. The abdomen is contained about 1.9 times in the length of the cephalothorax; the lateral corner of the last thoracic segment more produced on the right side than on the left. The rostrum directs slightly downwards.

The abdomen 5-segmented; the segments and furca are in the proportional lengths 24:32:29:21:5:8=100. The 1st segment has on the anterior border dorsal process which can be seen more distinctly from the left side. The 2nd, 3rd and 4th segments are furnished with coarse teeth on the posterior margin. The 2nd furcal seta about 1.5 times, the appendicular seta half the length of the marginal setae.

The 1st antenna extends beyond the end of the last thoracic segment by distal one joint; the joints are in the following proportional lengths:

Joint	1	2	3	4	5	6	7	8-9-10	11	12-13	14	15
	51	37	20	22	26	29	37	73	26	70	40	48
	16	17	18	19	20	21	22	23	24-25			
	55	55	59	66	62	59	55	40	70	=1000;		

the joint 19 is slightly shorter than the joints 24-25; no aesthetascs on the 20th.

The mouth parts are reduced; the outer lobe of the 1st maxilla has 5 long setae; the endopodite of the same appendage has 6 setae.

The 1st leg has 3-jointed exopodite and 1-jointed endopodite; the 1st joint of the exopodite with a minute outer edge spine. In the 2nd leg the outer edge spine of the 2nd joint of the exopodite short; the 2nd spine of the 3rd joint reaches half-way to the 3rd division.

The 5th pair of legs resemble those of *P. barbata* BRADY, but more irregular denticles of the tooth plate of the 2nd joint distinguishes the present specimen from the former; in the 3rd joint of the exopodite the inner process dilated at the distal end; the middle process rather slender as compared with that of *P. malayensis*.

*Remarks.* The present specimen resembles most closely *P. malayensis* in the structure of the maxillae, maxillipede and swimming legs, but can be distinguished from it by the shape of the rostrum, the proportional lengths of the joints of the 1st antenna, and somewhat shallow sinus of the 3rd joint of the 3rd exopodite of the 2nd

leg. In the male 5th pair of legs the tooth plate of the 2nd joint of the exopodite of the left leg, and the inner process of the 3rd joint of the exopodite are of characteristic features. The present species resembles also *E. propinqua* ESTERLY in the shape of the last thoracic segment and genital segment, but the slender rostrum and small size distinguish the species from the former. The species also comes near to *P. polaris* BRODSKY but the 2nd outer edge spine of the 3rd joint of the exopodite is much longer, reaching the base of the distal outer edge spine of the same joint.

*Occurrence.* 15 females and 3 males were collected from 1000-0 m., from Sagami and Suruga, November 1938.

*Pareuchaeta calva* sp. nov.

(Fig. 71, a-f)

*Female.* Length, 7.44 mm: the cephalothorax, 5.31 mm; abdomen, 2.31 mm. The abdomen is contained 2.5 times in the length of the cephalothorax. The profile of the

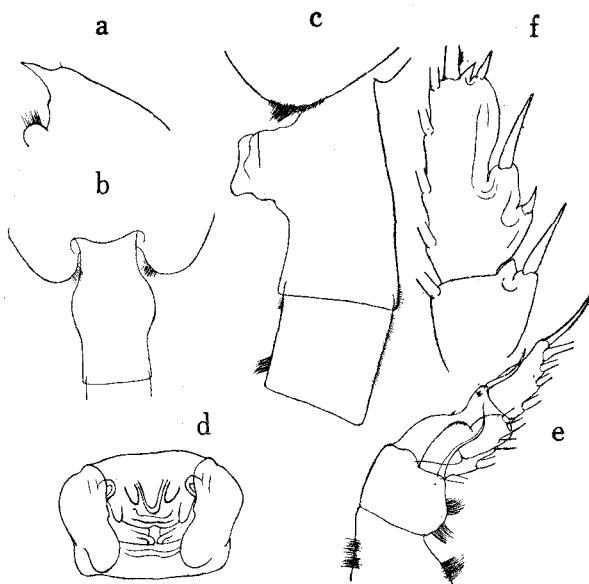


Fig. 71. *Pareuchaeta calva* sp. nov.

Female: a, head, lateral, aspect; b, last thoracic segment and abdominal segments, lateral aspect; d, genital opening, ventral aspect; e, 1st leg; f, exopodite of 2nd leg.

head rather straight; the rostrum slender, directs straight forwards. The posterior thoracic margin is rounded, and is provided with a tuft of short hairs instead of usual long ones.

The abdomen 4-segmented; the first three segments have the proportional lengths 19:10:9. The genital protuberance as that of *P. sarsi* (FARRAN) but the posterior

margin of the genital flanges more produced than that of *P. sarsi* when viewed from the lateral; the 2nd segment is furnished with scattered short hairs on the dorsal and proximal ventral surface. The 3rd segment with short hairs on the dorsal surface; the ventral surface of the same segment has long hairs forming three groups. The appendicular seta slender and long.

The 1st antenna 23-jointed, extends to the posterior margin of the last thoracic segment; the joints are in the proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	32	31	22	19	22	25	25	35	22	22	32	41	41	51
	16	17	18	19	20	21	22	23	24-25					
	60	60	60	71	73	67	60	54	74	=1000;				

the joints 24-25 are 1.35 times as long as the penultimate; the joint 19 is slightly longer than the joints 24-25; the joint 21 is 1.1 times as long as the joint 17.

The outer lobe of the 1st maxilla has 5 long setae and 2 minute spines. The other mouth parts do not show any characteristic features.

The 1st leg as that of the preceding species. In the 2nd leg the outer edge spine of the 2nd joint of the exopodite reaches about the end of the proximal spine of the 3rd joint; the proximal spine of the 3rd joint reaches the middle of the 2nd division of the same joint; the 2nd spine of the 3rd joint does not reach the distal margin of the 3rd joint.

*Remarks.* The present species closely resembles *P. sarsi* (FARRAN) but differs from it in the followings: smaller in size, rather slender rostrum, poor hairs on the lateral corner of the last thoracic segment, the shape of the genital protuberance, and the proximal marginal spine of the exopodite of the 3rd joint of the 2nd leg reaching only half-way to the base of the 2nd spine.

*Occurrence.* 5 females, July 1937 in Suruga, and one female, November 1937 in Sagami, from the depth 1000 m to the surface.

### *Pareuchaeta aequatorialis* nom. nov.

(Fig. 72, a-g)

*Euchaeta scotti*, WOLFENDEN (non *E. scotti* FARRAN), 1911, p. 301, pl. 35.

Several examples were taken in the collection, which seems to be identical with *E. scotti* described by WOLFENDEN in the South Polar Expedition (1911). But on closer examination his species is quite distinct from that originally described by FARRAN under the name *Euchaeta scotti* from the west coast of Ireland. And I propose the name *P. aequatorialis* for the form described by WOLFENDEN from the equatorial region of the Atlantic.

*Female.* Length, 5.30 mm: cephalothorax, 3.30 mm; abdomen, 1.60 mm. The abdomen is contained 2.3 times in the length of the cephalothorax. The body robust,

the cephalothorax about 1.4 times as long as wide. The last thoracic segment bluntly triangular with an usual tuft of hairs on the lateral corner; the postero-ventral margin of the segment slightly contracted in outline when seen from the lateral. The rostrum directs forwards and slightly downwards; the frontal prominence high.

The proportional lengths of the first three abdominal segments are 39:19:18. The lateral flanges of the genital opening resemble those of *E. scotti* FARRAN but there is no dorso-lateral ridge on the left side about the middle of the genital segment as is observed in *E. scotti*. The 2nd and 3rd segments have each coarse hairs on the ventral surface; the distal margin of the segments are fringed with coarse teeth. The anal segment has a tuft of hairs on the ventral. The appendicular seta about 3 times as long as the marginal setae.

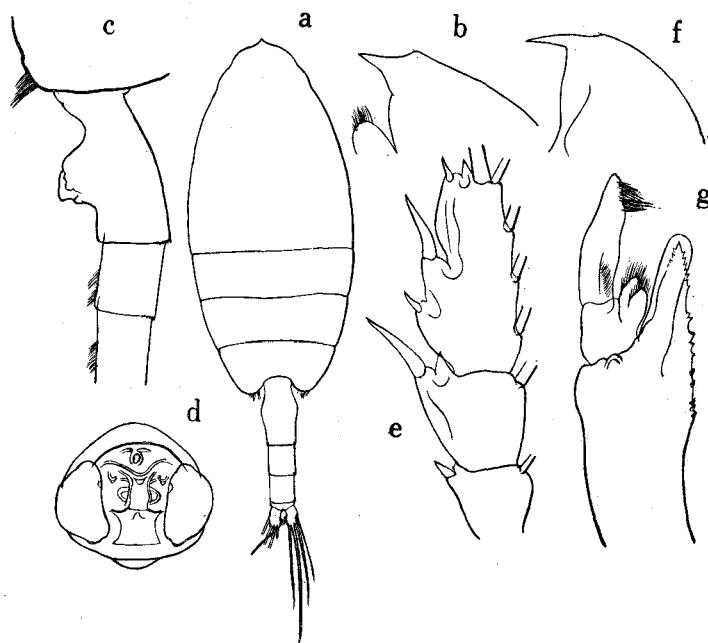


Fig. 72. *Pareuchaeta aequatorialis* nom. nov.

Female: a, dorsal aspect; b, head, lateral aspect; c, last thoracic segment and abdominal segments, lateral aspect; d, exopodite of 2nd leg. Male: f, head, lateral aspect; g, terminal joints of left 5th leg.

The 1st antenna 23-jointed, extends to the middle of the last thoracic segment; the joints are in the proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14	15
	28	56	31	25	28	25	30	31	19	19	31	44	44	47
	16	17	18	19	20	21	22	23	24-25					
	53	53	61	70	70	65	56	53	61	=1000;				



the distal joint is 1.16 times as long as the penultimate one, whereas, it is 1.50 times in *E. scotti*; the joint 21 is 1.24 times as long as the 17th, whereas, it is only 1.04 times in *E. scotti*.

The outer lobe of the 1st maxilla has 5 long setae. The other mouth parts as those of *E. barbata* BRADY.

The 1st leg has hairs on the outer margin of the 1st basal joint; the outer marginal spine at the bottom of the concavity of the joints 1-2 of the exopodite is very short; the outer edge spine of the 2nd joint extends just to the distal margin of the 3rd joint. In the exopodite of the 2nd leg the outer edge spine of the 2nd joint reaches about the end of the proximal outer marginal spine of the 3rd joint; the same spine of *E. scotti* is short, not reaching the end of the proximal spine; the 2nd outer marginal spine of the 3rd joint does not reach the base of the 3rd spine of the joint; the sinus at the base of the 2nd outer marginal spine is not deep.

*Male*. Length, 4.70 mm: cephalothorax, 3.25 mm; abdomen, 1.45 mm. The last thoracic segment rounded laterally; the left side is more produced than the right. The rostrum slender, directs downwards.

The abdomen 5-jointed; the segments and furca in the proportional lengths 24:25:21:16:5:9=100; the 1st segment has a dorsal swelling on the anterior border; the 2nd, 3rd and 4th segments are fringed with coarse teeth on the posterior margin. The 2nd furcal seta 1.5 times, the appendicular seta about as long as the marginal setae.

The 1st antenna 21-jointed, extends beyond the posterior margin of the thoracic segment by distal one joint; the proportional lengths of the joints as follows:

Joint	1	2	3	4	5	6	7	8-9-10	11	12-13	14
	60	40	23	20	25	30	35	75	25	60	43
	15	16	17	18	19	20	21	22	23	24-25	
	43	50	52	58	63	63	58	58	52	67	=1000;

no aesthetask on the joint 20.

The mouth parts do not show any characteristic features.

The 1st leg has no outer edge spine on the 1st joint of the exopodite. In the 2nd leg the 2nd outer edge spine of the 3rd joint is the longest, reaching the middle of the 3rd division.

In the 5th pair of legs the terminal joints of the left leg as shown in the figure; the tooth plate of the 2nd joint of the exopodite of the left leg is furnished with irregular denticles along the inner margin; the 1st joint of the exopodite of the right leg has a spine on the outer margin.

*Remarks*. The present species closely resembles *E. scotti* FARRAN but can be distinguished from it by the followings: somewhat slender rostrum; the more complicated structure of the genital opening; absence of dorso-lateral ridge on the genital segment; the proportional lengths of the joints of the 1st antenna; 5 long setae on the

outer lobe of the 1st maxilla; the short outer edge spine of the 2nd joint of the exopodite of the 2nd leg, not reaching the end of the proximal outer marginal spine of the 3rd joint; in the male the serrated plate of the 2nd joint of the exopodite of the left 5th leg is characteristic. SEWELL included WOLFENDEN's *scotti* in his proposed Group II which bears 7 setae on the Le. 1 of the 1st maxilla but it is incorrect; WOLFENDEN's *scotti* has, as WOLFENDEN describes, only 5 setae on the Le. 1 of the 1st maxilla.

*Occurrence.* 7 females and 3 males from Sagami and Suruga collection in the vertical hauls 1000-0 m, November and December 1937.

*Distribution.* The species has been recorded from the equatorial region of the Atlantic.

### *Pareuchaeta sarsi* (FARRAN)

(Fig. 73, a-j)

*Euchaeta sarsi* FARRAN, 1908, p. 41; *Pareuchaeta dentata* A. SCOTT, 1909 (male); *Euchaeta sarsi*. WITH, 1915, p. 177; *Pareuchaeta sarsi*, SARS, 1925, p. 114; SEWELL, 1947, p. 127; WILSON, 1950, p. 284; VERVOOT, 1957, p. 84.

*Female.* Length, 8.3-9.7 mm. The abdomen is contained 2.3 times in the length of the cephalothorax. The lateral corner of the last thoracic segment rounded, and is furnished each with a tuft of hairs. The rostrum directs forwards and somewhat downwards.

The first three abdominal segments have the proportional lengths 19:10:10. The genital protuberance as figured by Farran in lateral aspect; in dorsal view the lateral margins of the segment have a considerable swelling on each side about the middle. The 2nd and 3rd segments with scattered hairs on the dorsal surface, but they are very setose on the ventral surface. The 2nd furcal seta is about 3 times, the appendicular seta 6 times as long as the marginal ones.

The 1st antenna 23 jointed, extends about to the end of the cephalothorax; the joints are in the proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	42	42	24	21	26	26	26	35	21	24	30	39	40
	15	16	17	18	19	20	21	22	23	24-25			
	51	58	58	61	68	68	63	58	51	66	=1000.		

The outer lobe of the 1st maxilla has, beside 5 long setae and 2 minute spinules, 1 short seta proximally; the 2nd basal joint has 5, the endopodite 9 setae.

In the 1st leg there is a minute spine at the fusion of the 1st and 2nd joints of the exopodite. In the exopodite of the 2nd leg the outer edge spine of the 2nd joint reaches half-way to the proximal spine of the 3rd joint; the 2nd spine of the 3rd joint reaches the 5/6 of the distal section; the sinus at the base of the 2nd spine is not deep.

*Male.* Length, 6.94–7.71 mm. The abdomen is contained 2.3 times in the length of the cephalothorax. The last thoracic segment asymmetrical; the left side is more produced. The rostrum directs downwards. The proportional lengths of the abdominal segments and the furca are 22:27:25:17:2:7=100. The 1st abdominal segment has a dorsal process near the anterior border; it is more prominent when seen from the right than from the left side. The 2nd and 3rd segments are armed dorsally with coarse teeth, the posterior margin. The 2nd furcal seta is about 1.5 times, and the

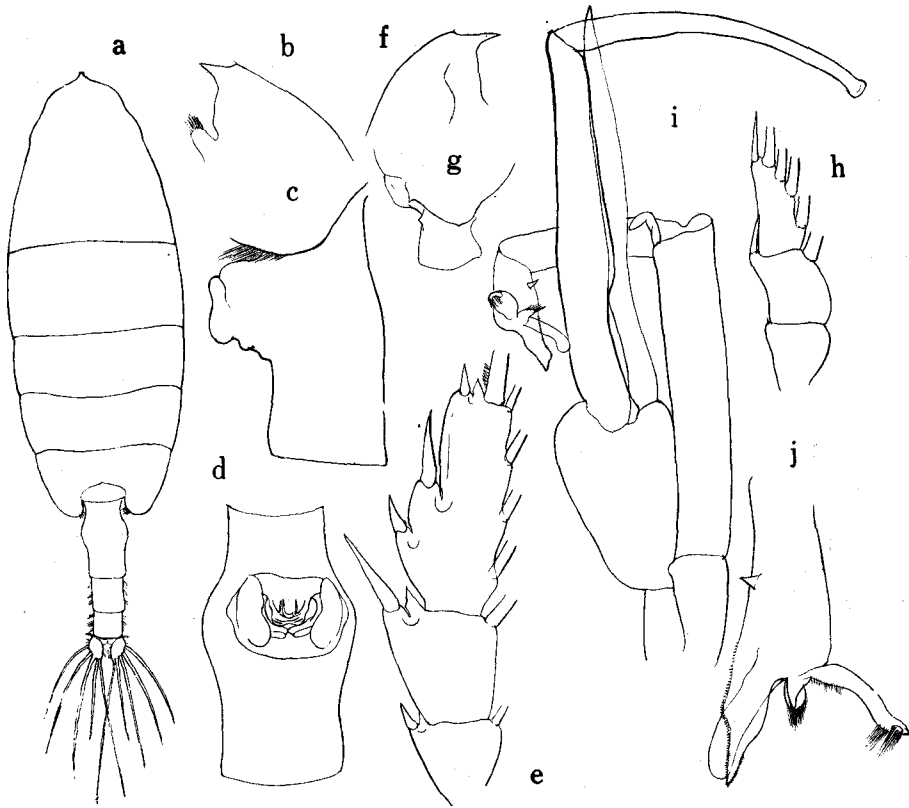


Fig. 73. *Pareuchaeta sarsi* (FARRAN).

Female: *a*, dorsal aspect, *b*, head, lateral aspect; *c*, last thoracic segment and genital segment, lateral aspect; *d*, genital segment, ventral aspect; *e*, exopodite of 2nd leg. Male: *f*, head, lateral aspect; *g*, last thoracic segment and genital segment, lateral aspect; *h*, exopodite of 1st leg; *i*, 5th pair of legs; *j*, terminal joints of left 5th leg.

appendicular seta about half the length of the marginal ones.

The 1st antenna 21-jointed, extends just beyond the end of the cephalothorax; the joints 8, 9 and 10 are fused; the joints 12–13 are fused on the posterior margin; the proportional lengths of the joints are as follows:

Joint	1	2	3	4	5	6	7	8-9-10	11	12-13	14
	47	34	20	20	27	28	34	75	25	67	38
	15	16	17	18	19	20	21	22	23	24-25	
	48	57	57	67	67	67	60	57	51	67	=1000.

The mouth parts are somewhat reduced. The outer lobe of the 1st maxilla has 5 long setae.

The 1st leg has 3-jointed exopodite and 1-jointed endopodite; the hairs on the outer margin of the 1st basal joint are wanting; the 1st joint of the exopodite with a minute outer edge spine. In the 2nd leg the outer edge spine of the 2nd joint of the exopodite reaches half-way to the base of the proximal spine of the 3rd joint; the 2nd spine of the 3rd joint does not reach the middle of the 3rd division. The 5th pair of legs agree quite well with the figures given by Sars; the thumb on the distal end of the left leg is lanceolated.

*Remarks.* *P. dentata* described by A. Scott in the "Siboga" Expedition appears to be identical with the male of *P. sarsi*. The male of *P. sarsi* described by A. Scott is a quite different species.

*Occurrence.* 28 females and 8 males in 8 vertical hauls from 1000 m to the surface in Suruga; 5 females in the haul from 1260 m to the surface in Suruga, December 1937; 1 female from Sagami, November 1937 from 1000-0 m.

*Distribution.* The species has a wide distribution in the deep waters of the Pacific, Atlantic, and Indian Oceans.

### *Pareuchaeta scotti* (FARRAN)

(Fig. 74, a-j)

*Euchaeta scotti*, FARRAN, 1908, p. 42; WITH, 1915, p. 179; *Pareuchaeta scotti*, Sars, 1925, p. 116; JESPERSEN, 1934, p. 81; SEWELL, 1947, p. 125; WILSON, 1950, p. 284.

*Female.* Length, 5.00 mm. The cephalothorax, 3.56 mm, the abdomen, 1.44 mm; the abdomen is contained 2.5 times in the length of the cephalothorax. The lateral corner of the last thoracic segment bluntly triangular in lateral view, and are furnished with an usual tuft of hairs. The rostrum heavy, directed somewhat downwards; the frontal prominence low.

The abdomen 4-segmented, the segments and furca in the proportional lengths 48:18:19:7:8=100. The genital segment slightly asymmetrical when viewed from the dorsal; the right lateral margin is somewhat inflated about the middle; there is a dorso-lateral ridge, which is clearly figured by FARRAN (pl. III, fig. 11); the genital protuberance has a small lateral flange; the distance between the posterior limit of the vulva and the distal margin of the segment is much longer than that of *P. aequatorialis* nom. nov. The 2nd and 3rd segments are furnished with short hairs only on the ventral surface.

The 1st antenna 23-jointed, reaches the middle of the 3rd thoracic segment; the joints are in the proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	51	41	26	21	26	26	28	36	23	23	28	44	41
	15	16	17	18	19	20	21	22	23	24-25			
	46	57	57	59	64	64	59	57	51	77	=1000;		

the distal joint is 1.5 times as long as the penultimate one; the 21st is 1.04 times as long as the 17th.

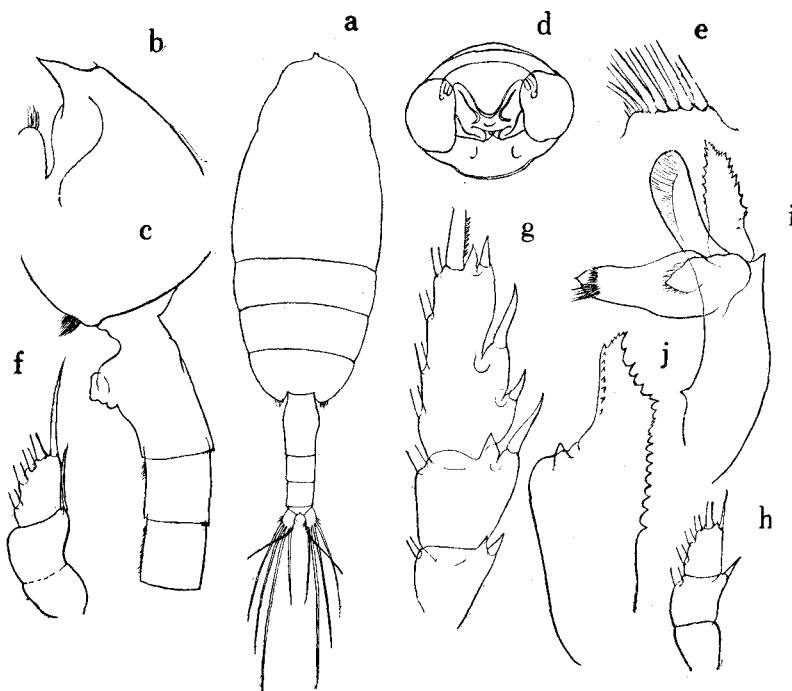


Fig. 74. *Pareuchaeta scotti* (FARRAN).

Female: *a*, dorsal aspect; *b*, head, lateral aspect; *c*, last thoracic segment and abdominal segments, lateral aspect; *d*, genital opening, ventral aspect; *e*, outer lobe of 1st maxilla; *f*, exopodite of 1st leg; *g*, exopodite of 2nd leg. Male: *h*, exopodite of 1st leg; *i*, terminal joints of left 5th leg; *j*, tooth-plate of the same joint.

In the 1st maxilla the outer lobe has 7 long and 2 short setae. The other mouth parts do not show any characteristic features.

In the 1st leg the 1st and 2nd joints of the exopodite are separate on the anterior surface; the outer edge spine of the concavity is very small; the outer edge spine of the 2nd joint exceeds the distal margin of the 3rd joint. In the 2nd leg the outer

edge spine of the 2nd joint of the exopodite does not reach the end of the proximal spine of the 3rd joint.

*Male.* Length, 4.75 mm. The cephalothorax, 3.32 mm; the abdomen, 1.25 mm. The lateral corner of the last thoracic segment more produced on the left than on the right. The rostrum rather heavy.

The 1st antenna extends beyond the end of the thoracic segment.

The 1st leg has 3-jointed exopodite; the 1st joint of the exopodite has no outer edge spine; the outer edge spine of the 2nd and the 3rd joints are short. The 5th pair of legs as figured by WITH; the serrated plate on the 2nd joint of the exopodite of the left leg as shown in the figure.

*Remarks.* The Pacific specimen, though slightly smaller in size, agree quite well with the description and figures given by FARRAN. WOLFENDEN's specimen taken from the tropical Atlantic is not identical with FARRAN's specimen of *P. scotti*; to the former I proposed the name *P. aequatorialis*.

*Occurrence.* One female and a male from deep waters of Sagami, November 1938.

*Distribution.* The species has been recorded from the North Atlantic and the Arabian Sea, and also from the Pacific.

### *Pareuchaeta elongata* (ESTERLY)

(Fig. 75, a-i)

*Euchaeta elongata*, ESTERLY, 1913, p. 182; *E. japonica*, MARUKAWA, 1921, p. 11; MORI, 1937, p. 47, BRODSKY, 1950, p. 209.

*Female.* Length, 6.81–7.39 mm. The abdomen is contained 2.3 times in the length of the cephalothorax. The lateral corner of the last thoracic segment produced into knob-like process. The rostrum slender, directs straight forwards and slightly downwards; the frontal prominence low.

The proportional lengths of the first three abdominal segments in 0.01 mm. are 97:52:43. The genital protuberance is not deep; the lateral flanges of the genital protuberance asymmetrical with a lamella at the right side of the orifice; the 2nd and 3rd segments are fringed with rather coarse teeth on the dorsal distal margin; the ventral surface of the segments are devoid of hairs. The anal segment very short consealed under the preceding segment, and has a tuft of hairs on the ventral surface. The ordinal furcal setae about as long as the combined lengths of the last three abdominal segments and furca; the 2nd seta about 2 times, and the appendicular seta 4 times as long as the marginal ones.

The 1st antenna reaches the end of the last thoracic segment; the joints are in 0.01 mm as follows:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	15	10	6	6	7	7	8	11	8	9	11	15	14

15 16 17 18 19 20 21 22 23 24-25  
 15 17 17 18 22 22 19 17 15 20.

The mouth parts as in *E. barbata*. The outer lobe of the 1st maxilla has 7+2 setae.

In the 1st leg the 1st basal joint without hairs on the outer margin; the articular membrane between the 1st and 2nd joints of the exopodite is obscure; the outer marginal spine at the bottom of the concavity absent. In the exopodite of the 2nd leg the outer edge spine of the 2nd joint reaches the base of the proximal spine of the 3rd joint; the 2nd outer marginal spine of the 3rd joint reaches about the distal margin of the joint.

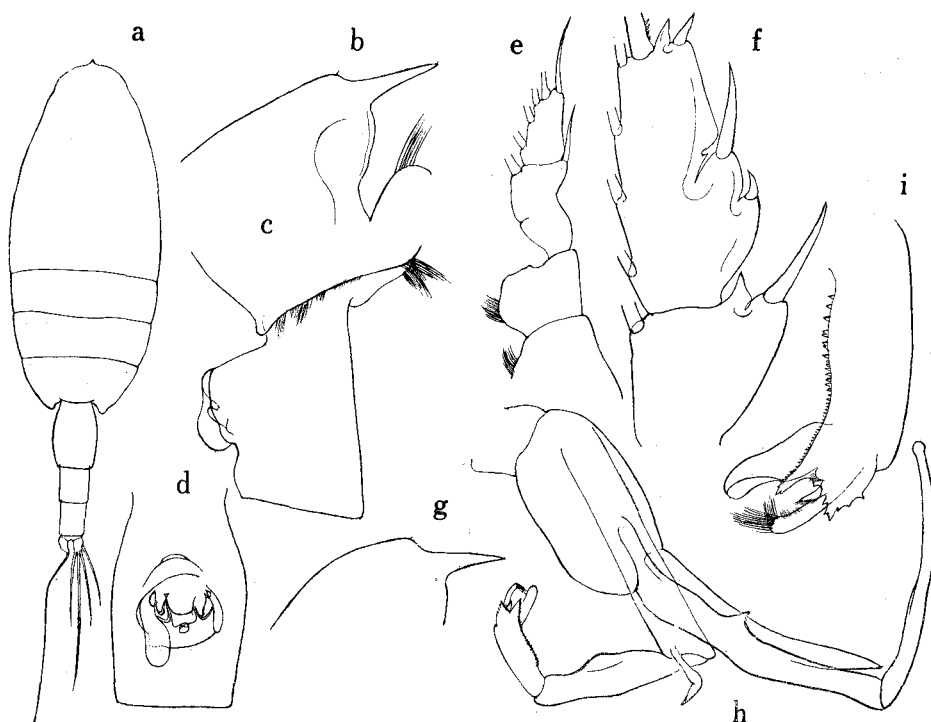


Fig. 75. *Pareuchaeta elongata* (ESTERLY).

Female: *a*, dorsal aspect; *b*, head, lateral aspect; *c*, last thoracic segment and genital segment, lateral aspect; *d*, genital segment, ventral aspect; *e*, exopodite of 1st leg; *f*, exopodite of 2nd leg. Male: *g*, head, lateral aspect; *h*, 5th pair of legs; *i*, terminal joints of left 5th leg.

*Male*. Length, 6.28 mm. The cephalothorax, 4.40 mm; the abdomen, 1.88 mm. The rostrum long, directs downwards; the frontal prominence low. The first abdominal segment has a dorsal process near the anterior border. The furcal setae about as long as the combined lengths of the last four abdominal segments and furca; the

proportional lengths of the 2nd, appendicular, and the other marginal setae are 37:15:22.

The 1st antenna extends beyond the end of the last thoracic segment by terminal two joints; the 20th joint without aesthetask.

The 5th pair of legs as shown in the figure.

*Remarks.* The specimen, though larger in size than those from the San Diego region, agrees well with the description of the female of *E. elongata*. *E. japonica* MARUKAWA from the Sea of Japan is clearly identical with *E. elongata* ESTERLY. The female specimen can be easily distinguished by the shape of the last thoracic segment and the genital boss. ESTERLY's specimen measured 4.13 mm.; those from the Japanese waters measured about 8.00 mm. in the female, and 8.40 mm. in the male; the specimen from the Far-Eastern Sea measured 6.3–6.5 mm in the female, and 5.5–6.2 mm. in the male.

*Occurrence.* 3 females and one male in November 1937, and one female in April 1938 in from the depth 1000–0 m Sagami Bay.

*Distribution.* The species is distributed in the North Pacific and North Polar Sea. It has been recorded from the waters below the depth 200 fathoms in the Japan Sea and from the depth 240–120 fathoms near Hokkaido. The specimen of the Izu region might have been brought down into Sagami Bay by the cold intermediate water of the Oyashio current. It has not been obtained from Suruga Bay.

### *Pareuchaeta crassa* sp. nov.

(Fig. 76, a-i)

*Female.* Length, 6.95–7.25 mm. The abdomen is contained 2.3 times in the length of the cephalothorax. The cephalothorax robust, about half as wide as long. The lateral corner of the last thoracic segment bluntly triangular with a tuft of long hairs. The rostrum broad; the frontal prominence low.

The first 3 abdominal segments in 0.01 mm are 100:50:37. The genital segment has 2 low tubercles closely set together on the left side, slightly anterior to the base of the genital boss; the right side has also a low tubercle opposite to those of the left; the genital protuberance is not deep; the lateral flanges rounded and produced posteriorly. The 2nd and 3rd segments are furnished with hairs on the ventral surface; the posterior margin of the segments are fringed with groups of fine spinules. The 2nd furcal seta about 1.5 times as long as the remaining marginal ones; the appendicular seta slender and long.

The 1st antenna 23-jointed, reaches the posterior margin of the last thoracic segment; the joints are in the proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	46	46	25	23	27	29	25	34	20	21	27	43	39
	15	16	17	18	19	20	21	22	23	24-25			
	46	57	61	61	68	64	61	57	52	68	=1000;		



the 17th joint is as long as the 21st; the 19th joint as long as the 24-25th. The outer lobe of the 1st maxilla with 6 long and 1 short setae.

In the 1st leg the articular membrane between the 1st and 2nd joints of the exopodite can be clearly observed on the anterior surface; the 1st joint of the exopodite with a minute outer edge spine at the bottom of the concavity. In the 2nd leg the outer edge spine on the 2nd joint of the exopodite reaches a point half-way to the proximal outer edge spine of the 3rd joint; the 2nd spine of the 3rd joint does not reach the distal margin of the joint.

*Male.* Length, 6.19 mm. The cephalothorax, 4.25 mm; the abdomen, 1.94 mm. The abdomen is contained 1.94 times in the length of the cephalothorax. The frontal

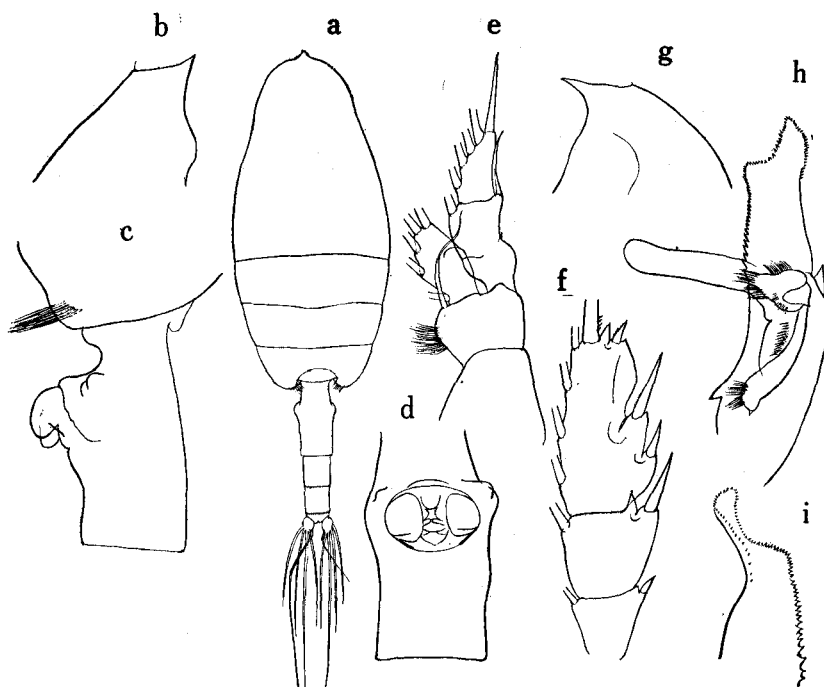


Fig. 76. *Pareuchaeta crassa* sp. nov.

Female: *a*, dorsal aspect; *b*, head, lateral aspect; *c*, last thoracic segment and genital segment, lateral aspect; *d*, genital segment, ventral aspect; *e*, 1st leg; *f*, exopodite of 2nd leg. Male: *g*, head, lateral aspect; *h*, terminal joints of left 5th leg; *i*, tooth-plate of the same joint.

prominence low; the rostrum heavy, directs forwards and somewhat downwards. The 1st abdominal segment has a dorsal process on the anterior border. The furcal setae about as long as the combined lengths of the abdominal segments and the furca; the appendicular seta half the length of the marginal ones. The 1st antenna extends to the end of the thoracic segment; the 20th joint has an aesthetasc. In the 5th pair of legs the outer margin of the 1st joint of the exopodite of the right leg is smooth;

the distal joint of the left leg as figured.

*Remarks.* The shape of the genital segment distinguishes the species from any of hitherto known species.

*Occurrence.* 5 females and 1 male in November 1937, and 3 females in April 1938 in the vertical hauls from 1000-0 m in Sagami Bay.

*Pareuchaeta birostrata* BRODSKY

(Fig. 77, a-i)

*Pareuchaeta birostrata*, BRODSKY, 1950, p. 213, fig. 127.

*Female.* Length, 7.39-8.13 mm. The abdomen is contained 2.5 times in the length of the cephalothorax. The lateral corner of the last thoracic segment rounded, and is furnished with a tuft of long hairs. The rostrum directs straight forwards; the frontal prominence high.

The abdomen 4-segmented, the segments and furca in the proportions 46:21:19:3:11=100. The genital segment has lateral swellings about the middle and has a small tubercle on the left side of the segment slightly anterior to the base of the genital boss when viewed from the ventral; the genital protuberance deep; the lateral flanges straight in lateral aspect. The marginal anal segment very short, concealed beneath the preceding. The furcal setae about as long as the combined lengths of the 1st and 2nd abdominal segments together; the 2nd seta about 1.5 times, the appendicular seta 2.5 times as long as the remaining marginal one.

The 1st antenna 23-jointed, extends just beyond the end of the cephalothorax; the joints as in the following proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	51	42	22	19	25	25	25	31	20	20	25	39	29
	15	16	17	18	19	20	21	22	23	24-25			
	48	59	62	62	73	70	62	62	51	68	=1000;		

the 17th joint is about as long as the 21st; the 19th joint is longer than the 24-25th which is 1.34 times as long as the penultimate one. The outer lobe of the 1st maxilla has 7 long and 2 short setae. The other mouth parts do not show any characteristic features.

In the 1st leg the articular membrane between the 1st and the 2nd joints of the exopodite are barely indicated; the outer edge spine of the 3rd joint is slender, about 1.6 times as long as the 3rd joint itself. In the 2nd leg the outer edge spine of the 2nd joint of the exopodite reaches the middle of the proximal spine of the 3rd joint; the 2nd spine of the 3rd joint falls short of the base of the 3rd spine; the sinus at the base of the 2nd spine is deep that it reaches the line joining the base of the 1st outer edge spine and the 2nd inner edge seta.

*Male.* Length, 6.39 mm. The cephalothorax, 4.45 mm, the abdomen, 1.94 mm, so the abdomen is contained 2.3 times in the length of the cephalothorax. The rostrum directs downwards; the frontal prominence low. The proportional lengths of the first four segments are 20:35:29:20. The 1st segment has a dorsal swelling near the anterior border. The ordinary marginal furcal setae about as long as the combined lengths of the abdominal segments and furca; the appendicular seta  $\frac{2}{3}$  the length of the marginal ones.

The 1st antenna exceeds just beyond the end of the last thoracic segment; the 20th joint has no aesthetask.

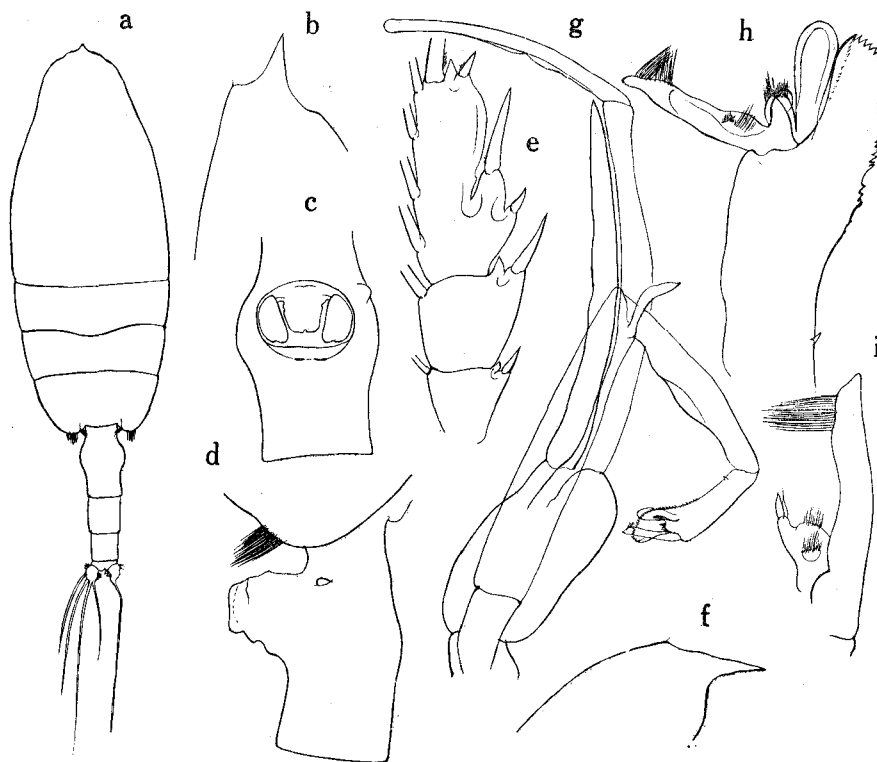


Fig. 77. *Pareuchaeta birostrata* BRODSKY.

Female: a, dorsal aspect; b, head, lateral aspect; c, genital segment, ventral aspect; d, last thoracic segment and genital segment, lateral aspect; e, exopodite of 2nd leg. Male: f, head, lateral aspect; g, 5th pair of legs; h, terminal joints of left 5th leg; i, 3rd joint of exopodite of left 5th leg.

In the left 5th leg the middle process of the 3rd joint of the exopodite is peculiarly shaped as shown in the figure.

*Remarks.* The species closely resembles *E. californica* ESTERLY but the female specimen can be distinguished from the former in the followings: the proportional length of the 1st antenna; the length of the outer edge spine of the 2nd joint of the exopodite

of the 2nd leg, in *E. californica* the spine exceeds well beyond the end of the proximal outer marginal spine of the 3rd joint, whereas, it is much shorter in the present species; furthermore, the 2nd outer marginal spine of the 3rd joint of the exopodite of the 2nd leg does not reach the end of the 3rd outer marginal spine of the same joint, whereas, in *E. californica* it reaches the end of the 3rd outer marginal spine. The 5th pair of leg of the male are characterised by the shape of the distal joint of the exopodite of the left leg. This is the same species which I reported in the list of species under the name *P. nitida* sp. nov. in 1953.

*Occurrence.* 50 females and 6 males in 18 hauls from the depth 1000-0 m in Sagami, and 1 female and 2 males from the depth 1260-0, in Suruga Bay, December 1937.

*Distribution.* The species has been reported from the Far-Eastern and Polar Seas.

### *Pareuchaeta hanseni* WITH

(Fig. 78, a-h)

*Euchaeta hanseni*, WITH, 1915, p. 181; *Pareuchaeta hanseni*, SARS, 1925, p. 115; JESPERSEN, 1934, p. 80; SEWELL, 1947, p. 121; WILSON, 1950, p. 282.

*Female.* Length, 8.7 mm. The cephalothorax, 6.2 mm, the abdomen, 2.5 mm; so the abdomen is contained 2.5 times in the length of the cephalothorax. The lateral corner of the last thoracic segment rounded and furnished with a tuft of rather poor hairs. The rostrum moderate, directs forwards; the frontal prominence low.

The first three abdominal segments in 0.01 mm are 106:56:56. The genital protuberance deep; the lateral flanges of the genital opening projects posteriorly. The ventral surface of the 2nd and 3rd segments very setose. The anal segment short, with short hairs on the ventral surface. The furca about 1.4 times as long as wide; the 2nd furcal seta about 2.5 times as long as the remaining ones; the appendicular seta slender and long.

The 1st antenna extends to the end of the last thoracic segment; the joints are in the proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	40	46	21	21	21	24	24	31	13	18	25	40	40
	15	16	17	18	19	20	21	22	23	24-25			
	49	58	61	64	76	70	67	58	55	73	=1000.		

The outer lobe of the 1st maxilla has 7 long and 2 short slender setae. The other mouth parts as in *E. barbata*.

The exopodite of the 1st leg has moderately long spine at the bottom of the concavity. In the exopodite of the 2nd leg the outer edge spine of the 2nd joint reaches the base of the proximal spine of the 3rd joint; the 2nd spine of the 3rd

joint reaches about the base of the 3rd spine of the same joint.

*Male.* Length, 8.27 mm. The cephalothorax, 5.70 mm; the abdomen, 2.57 mm. The rostrum long and slender; the frontal prominence low. The 1st abdominal segment has a dorsal process on the anterior border. The marginal furcal setae as long as the combined lengths of the last 4 abdominal segments and the furca; the 2nd seta 1.5 times, the appendicular seta half the length of the remaining ones.

The 1st antenna extends beyond the end of the last thoracic segment by last 2 joints; the 20th joint has an aesthetask.

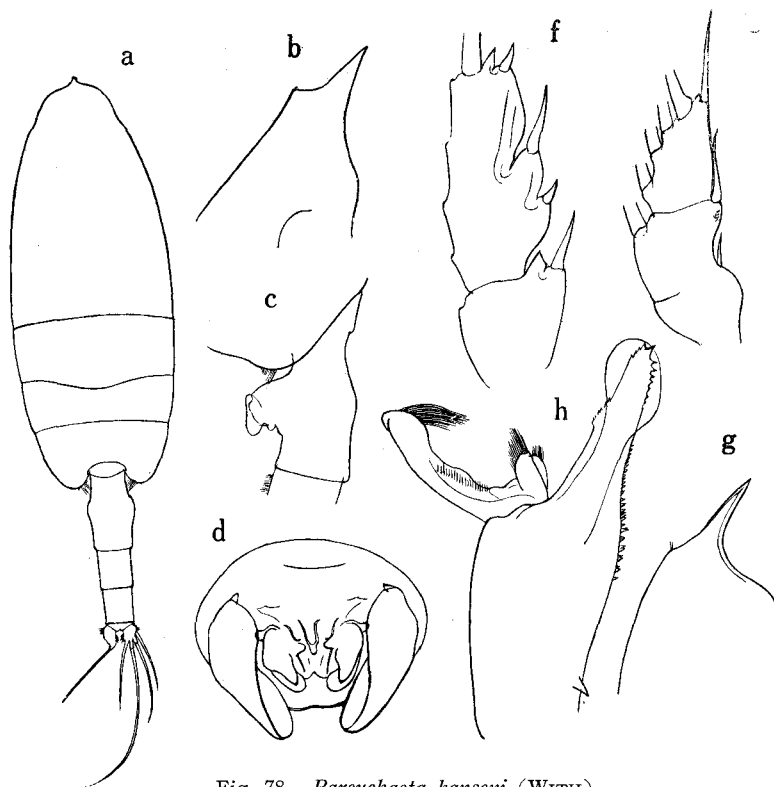


Fig. 78. *Pareuchaeta hanseni* (WITH).

Female: *a*, dorsal aspect; *b*, head, lateral aspect; *c*, last thoracic segment and abdominal segment, lateral aspect; *d*, genital opening, ventral aspect; *e*, exopodite of 1st leg; *f*, exopodite of 2nd leg. Male: *g*, head, lateral aspect; *h*, terminal joints of left 5th leg.

The 1st joint of the exopodite of the right 5th leg has a spine on the outer margin. The distal joint of the exopodite of the left leg as shown in the figure.

*Occurrence.* 2 females and 3 males from Sagami in the vertical hauls 1000–0 m, November 1937.

*Distribution.* The species has been recorded from the North Atlantic, the Arabian Sea, and also from the Pacific.

*Pareuchaeta comosa* sp. nov.

(Fig. 79, a-j)

*Female.* Length, 8.8–9.3 mm. The proportional lengths of the cephalothorax and abdomen in mid-dorsal line is 66 to 25, so the abdomen is contained 2.6 times in the length of the cephalothorax. The lateral corner of the last thoracic segment rounded and furnished with usual tufts of hairs. The head contracts anteriorly. The rostrum slender, directs straight forwards; the frontal prominence low.

The proportional lengths of the first 3 abdominal segments are 19:9:8. The genital segment has a small dorso-lateral process near the anterior border on the left side; the genital boss is not deep; the lateral flanges produced posteriorly, and is convex at the middle portion. The posterior margins of the 2nd and 3rd segments are fringed with fine teeth on the dorsal; the ventral surface of the 3rd segment is setose. The proportional lengths of the 2nd, appendicular and remaining furcal setae are 3:7:1.

The 1st antenna extends beyond the end of the last thoracic segment by distal one joint when fully reflexed; the joints are in the following proportional lengths:

Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	33	41	23	20	25	25	25	35	23	30	30	43	41
	15	16	17	18	19	20	21	22	23	24-25			
	53	61	61	61	68	64	61	58	51	68	=1000;		

the 17th joint is as long as the 21st; the 19th as long as the 24–25th.

The mouth parts as in *P. sarsi*. The outer lobe of the 1st maxilla has 6 long and 1 short setae.

In the 1st leg the articular membrane between the 1st and 2nd joints of the exopodite well marked; there is a group of short hairs at the base of the minute outer edge spine arising from the bottom of the concavity; the distal margin of the joints 1–2 is furnished with 2 groups of short hairs; the outer margin of the 3rd joint is not smooth but has a small swelling about the proximal 1/3 of the joint; the outer margin of the same joint has 2 groups of short hairs, one at the proximal, and the another on the swelling. In the exopodite of the 2nd leg the outer edge spine of the 2nd joint reaches the base of the proximal spine of the 3rd joint; the 2nd spine of the 3rd joint of exopodite does not reach the distal margin of the joint; the sinus at the base of the 2nd spine is very deep that it reaches well to the line drawn between the base of the proximal outer edge spine and the 1st proximal inner marginal seta; there are fairly long hairs at the inner proximal margin of the 2nd outer marginal spine of the 3rd joint of exopodite. The outer margin of the 3rd joint of the exopodite of the 3rd leg as shown in the figure.

*Male.* Length, 7.25 mm. The cephalothorax, 4.81 mm, the abdomen, 2.44 mm; so the abdomen is contained 1.98 times in the length of the cephalothorax. The lateral

corner of the last thoracic segment rounded, and produced more on the left side. The rostrum is long and straight but directs slightly downwards; the frontal prominence low.

The proportional lengths of the abdominal segments and the furca are 28:36:34:25:6:10=100. The 1st segment has a dorsal process near the anterior border. The 2nd, 3rd, and 4th segments have each coarse teeth on the distal margin. The 2nd furcal seta 1.5 times, the appendicular seta about half the length of the remaining ones.

The 1st antenna extends beyond the end of the last thoracic segment by distal

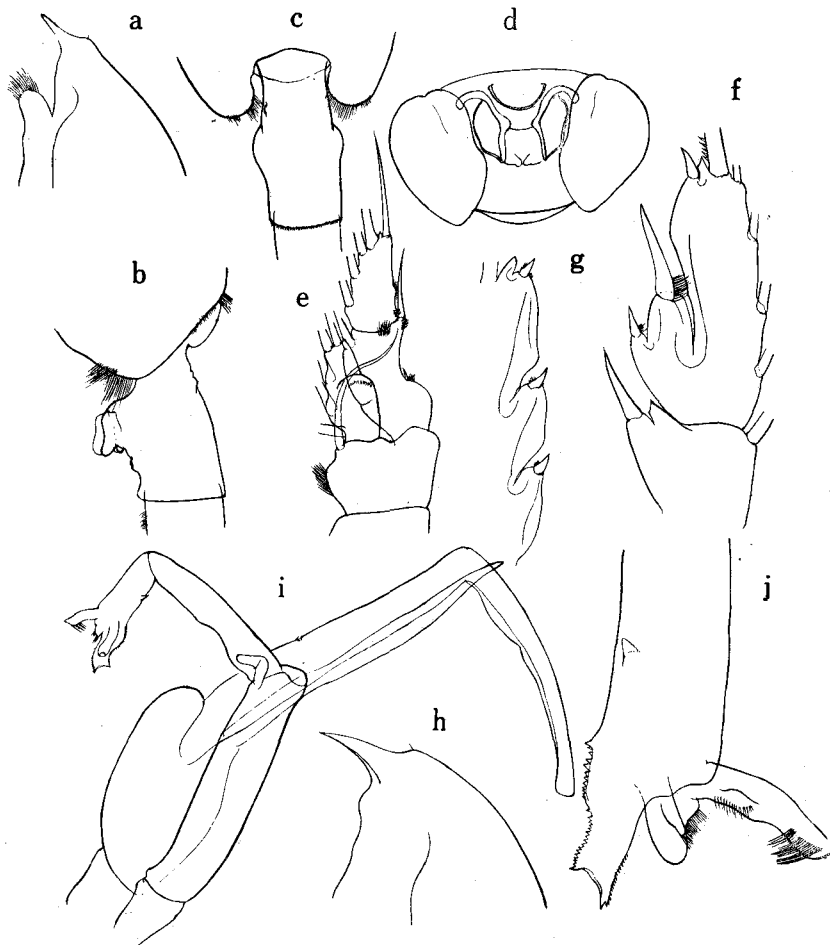


Fig. 79. *Pareuchaeta comosa* sp. nov.

Female: a, head, lateral aspect; b, last thoracic segment and genital segment, lateral aspect; c, last thoracic segment and genital segment, dorsal aspect; d, genital opening, ventral aspect; e, 1st leg; f, exopodite of 2nd leg; g, outer margin of 3rd joint of exopodite of 3rd leg. Male: h, head, lateral aspect; i, 5th pair of legs; j, terminal joints of left 5th leg.

one joint; the joints are in the proportional lengths:

Joint	1	2	3	4	5	6	7	8-9-10	11	12-13	14
	38	32	19	19	26	26	29	69	22	64	38
	15	16	17	18	19	20	21	22	23	24-25	
	48	58	58	61	71	71	64	61	55	71	=1000;

the 19th is as long as the 24-25th; the 24-25 is 1.3 times as long as the 23rd; no aesthetascope on the 20th. The mouth parts do not show any characteristic features.

In the 1st leg the 1st joint of the exopodite has a very minute outer edge spine. The 2nd leg is not characteristic; the 2nd spine of the 3rd joint of the exopodite reaches about the middle of the 3rd division. In the 5th pair of legs the thumb on the left leg resembles that of *P. dubia* ESTERLY but differs from it in not having dentation on the apical section; in the right leg the 1st joint of the exopodite has a spine on the outer margin.

*Remarks.* The present species resembles *P. sarsi* (FARRAN) but can be recognised by the shape of the genital segment, the slender rostrum, the number of setae on the outer lobe of the 1st maxilla, and the structure of the 1st and 2nd legs of the female.

*Occurrence.* 2 females and one male in the vertical haul from 1260-0 m, December 1937, and 4 females in the vertical hauls from 1000-0 m, November 1937 in Suruga Bay; 4 females in the vertical hauls from 1000-0 m., November 1937, and 2 females in the vertical hauls from 1000-0 m, April 1938 in Sagami Bay.

### *Pareuchaeta tonsa* (GIESBRECHT)

(Fig. 80, *a-i*)

*Euchaeta tonsa*, GIESBRECHT, 1898, p. 40; FARRAN, 1905, p. 35; ESTERLY, 1906, p. 64; *Pareuchaeta tuberculata*, A. SCOTT, 1909, p. 76 (male); *Euchaeta tonsa*, WITH, 1915, p. 166; *Pareuchaeta tonsa*, SARS, 1925, p. 122; SEWELL, 1947, p. 131; WILSON, 1950, p. 284; BRODSKY, 1950, p. 208.

*Female.* Length, 6.1-6.7 mm. The abdomen is contained 2.4 times in the length of the cephalothorax. The lateral corner of the last thoracic segment triangular but not so pointed as figured by WITH; there is no tuft of hairs along the lateral corner. The rostrum short, directs forwards. The frontal prominence high.

The first three abdominal segments have the proportional lengths 40:24:24. The genital segment much inflated on the distal half when viewed from the dorsal; the genital protuberance arises from the distal margin of the segment, and is very prominent. The 2nd and 3rd segments are devoid of hairs on the dorsal surfaces; the ventral surface of the 3rd segment is furnished with groups of hairs. The 2nd furcal seta about 3 times, the appendicular seta about 6 times as long as the remaining ones.

The 1st antenna reaches the end of the 3rd thoracic segment; the joints are in the proportional lengths:



Joint	1	2	3	4	5	6	7	8-9	10	11	12	13	14
	52	48	24	24	26	28	28	54	24	22	28	44	40
	15	16	17	18	19	20	21	22	23	24-25			
	44	56	56	60	72	68	60	52	46	64	=1000;		

the 17th joint is shorter than the 21st; the 24-25th shorter than the 19th. The outer lobe of the 1st maxilla bears 7 long and 2 short setae.

In the 1st leg the articulation between the 1st and the 2nd joints of the exopodite obscure; there is a minute spine at the base of the concavity. In the 2nd leg the

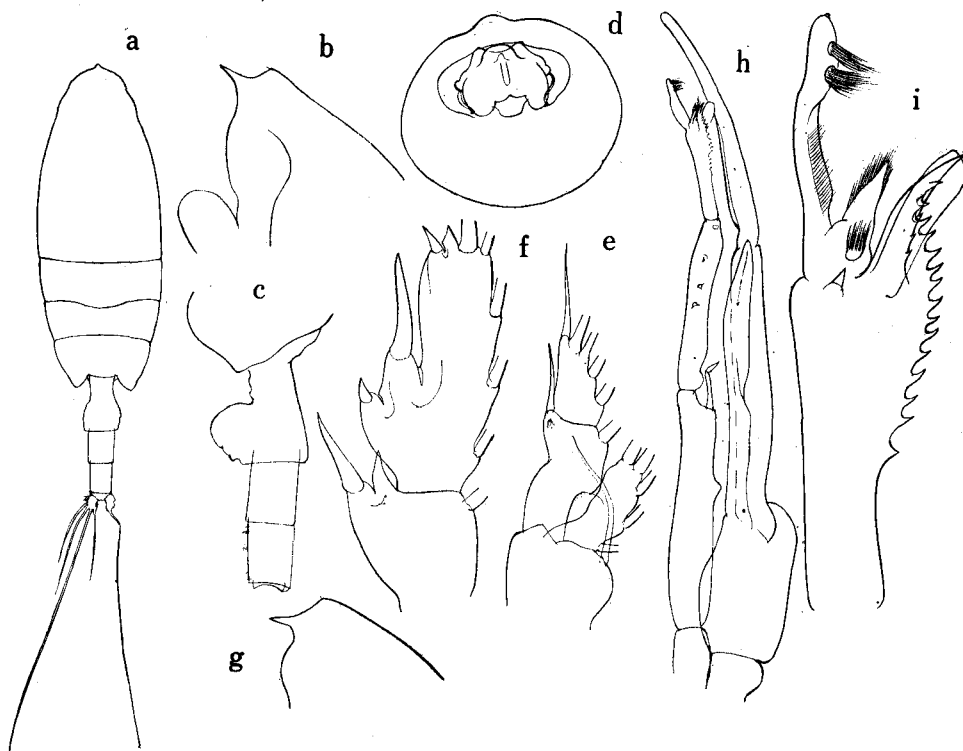


Fig. 80. *Pareuchaeta tonsa* (GIESBRECHT).

Female: *a*, dorsal aspect; *b*, head, lateral aspect; *c*, last thoracic segment and abdominal segments, lateral aspect; *d*, genital opening, ventral aspect; *e*, 1st leg; *f*, exopodite of 2nd leg. Male: *g*, head, lateral aspect; *h*, 5th pair of legs; *i*, terminal joints of left 5th leg.

outer edge spine of the 2nd joint of the exopodite exceeds the base of the proximal spine of the 3rd joint; the 2nd outer edge spine of the 3rd joint reaches the distal margin of the joint; this agrees well with the description given by WITH, but according to A. SCOTT the spine does not reach the distal margin of the 3rd joint.

*Male*. Length, 5.43-5.88 mm. The abdomen is contained about 2.2 times in the

length of the cephalothorax. The lateral corner of the last thoracic segment more produced on the left side than on the right. The frontal prominence high. The rostrum short, directs forwards and downwards. The proportional lengths of the abdominal segments and the furca are 23:27:24:14:5:7=100. The genital segment has a dorsal process near the anterior border. The 2nd, 3rd, and 4th segments are fringed with coarse teeth on the posterior margin. The 2nd furcal seta about 1.5 times the length of the marginal ones, the appendicular seta very slender but a little shorter than the 2nd seta.

The 1st antenna extends beyond the end of the cephalothorax by last one joint; the proportional lengths of the joints are as follows:

Joint	1	2	3	4	5	6	7	8-9-10	11	12-13	14
	48	36	20	20	26	31	36	72	28	32	40
	15	16	17	18	19	20	21	22	23	24-25	
	48	56	59	59	76	76	63	59	52	63	=1000;

the 19th joint is longer than the 24-25th. The mouth parts are somewhat reduced.

The 1st leg with 3-jointed exopodite and 1-jointed endopodite; the 1st joint of the exopodite has a minute outer edge spine. In the 2nd leg the outer edge spine of the 2nd joint of the exopodite is short, reaching about the middle of the 1st division of the 3rd joint of the exopodite; the 2nd spine of the 3rd joint is the longest and exceeds the middle of the 3rd division.

The 5th pair of legs resemble quite well with those of *E. norvegica* (BOECK). In the left leg the thumb on the distal joint of the exopodite has the denticles more regularly arranged than in *E. norvegica*; there is a short pointed process on the distal outer margin near the junction with the 3rd joint; the haired middle process at the base of the 3rd joint of the exopodite is long and spiniform; the 1st joint of the exopodite of the left leg has 2 tubercles on the middle of the outer margin, and a small spine midway between the distal tubercle and the distal margin of the same joint. The exopodite of the right leg 2-jointed and elongate.

*Remarks.* Absence of the male specimen of *P. tonsa* in the "Siboga" collection seems to be very strange. *P. tuberculata* described and figured by A. SCOTT, though larger in size (6.8 mm), appears to be the male of *P. tonsa*. The Pacific specimen differs in some minute points from those of the Atlantic.

*Occurrence.* One of the most common species in the deep waters of the Izu region.

*Distribution.* The species is widely distributed in the deep waters of the Atlantic, Indian, and Pacific Oceans. The species has also been recorded from the Sea of Japan, and Ochotsk sea.